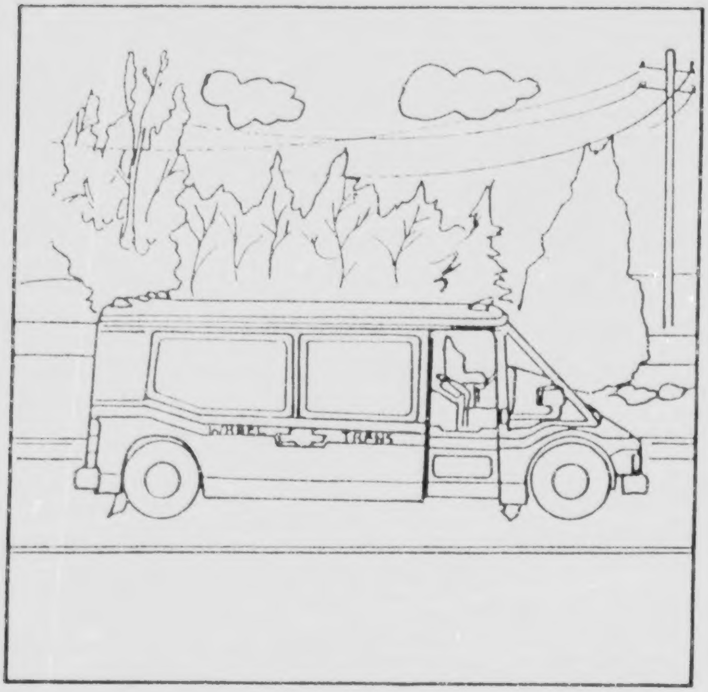
COST / BENEFIT ANALYSIS OF FULL INTEGRATION OF WHEEL -TRANS


WHEEL TRANS

Toronto Transit Commission

November, 1987

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EXECUTIVE SUMMARY

E.1 Introduction

On June 23 and 26, 1987, Metropolitan Toronto Council considered a report by TTC Commissioner T. Jakobek entitled "New Directions - A Plan for Enhanced Public Transit Services for the Mobility Disadvantaged," which recommended that the TTC assume operation of all aspects of the Wheel-Trans service when the current contract with All-Way expires. The Council adopted this recommendation in principle, subject to receiving subsidy guarantees from the Province of Ontario and certain further information from the TTC. As stated in the Council minutes, the Commission was asked specifically:

- *to report on the availability and adequacy of existing facilities, or on the need for new facilities as it related to the takeover of the Wheel-Trans service by the Toronto Transit Commission, such report to address the question of one or more locations for vehicle maintenance and operations; and*
- *to report back to the Transportation Committee by the end of October, 1987, on an accurate estimate of costs and a schedule for the takeover of the Wheel-Trans service.*

This report is a response to the above requests from Metropolitan Council and it will show that the long-term cost premium for having the TTC assume all Wheel-Trans maintenance and operations functions is no more than three percent, and probably less. This report will be discussed with All-Way management, and they will be presenting their own view of the issues.

E.2 The Existing Situation

By any reasonable measure, Wheel-Trans has been a great success in meeting its original objectives. Started in

1975 as a pilot project with seven vans and 46 riders for work trips only, the operation now utilizes 126 vehicles, has 18,500 registered riders, and in 1987 will serve about 606,000 trips. Despite this rapid rate of growth, however, the travel demand of the disabled community is not being met. At present, about 10 percent of requested trips cannot be accommodated due to inadequate capacity, and the number of registered users is projected to grow significantly.

At present, Wheel-Trans ridership represents about 0.28 trips per capita for Metropolitan Toronto. The Ontario Ministry of Transportation and Communications estimates that under current eligibility guidelines, a specialized transit system for the disabled should carry in the range of 0.4 to 0.8 annual trips per capita when demand is being met. A mid-range target of 0.6 trips per capita (Ottawa currently has 0.51, and Hamilton 0.54) would represent 1,300,000 trips per year by Metro Toronto's disabled community.

Metro Toronto and the TTC are therefore approaching a watershed decision on the provision of transportation services for the disabled. The scale of operation will continue to grow, and will require significant capital investment, irrespective of which organization actually operates it.

The TTC's existing contract with All-Way Transportation Corporation expires on October 31, 1988. All-Way have been providing the drivers and the maintenance for the service and, until recently, the vehicles. TTC staff have been taking customer orders and scheduling and dispatching the vehicles since 1982, and the TTC also recently supplied some new Orion II vehicles for All-Way's use. So, in fact, the TTC "takeover" would involve only the two functional areas that still remain with All-Way: vehicle maintenance and the supply of drivers.

E.3 Cost Method

The comparison of the two options - TTC operation versus continued contract operation - is not as simple as it seems, because of the capital investment required. The most straightforward approach is to consider the current All-Way operation, estimate what it would cost the TTC to do it, and compare them. This was the approach taken in Commissioner Jakobek's earlier report. This report goes one step further, with additional information, and considers the longer-term cost implications of the two possible strategies. The method used here is the "annualized total cost" approach, which represents an annual cost, including both capital and operations, expressed in constant 1987 dollars. This method takes into account the projected growth in Wheel-Trans service for either option, which is shown in Exhibit E-1. More specifically, the approach taken was as follows:

1. Capital and operating expenditures related to each option were identified by year in constant dollar terms (1987 $) over the relevant period from 1987 to 1996.

2. This stream of cash flows was then adjusted to reflect the projected inflation rate (5 percent).

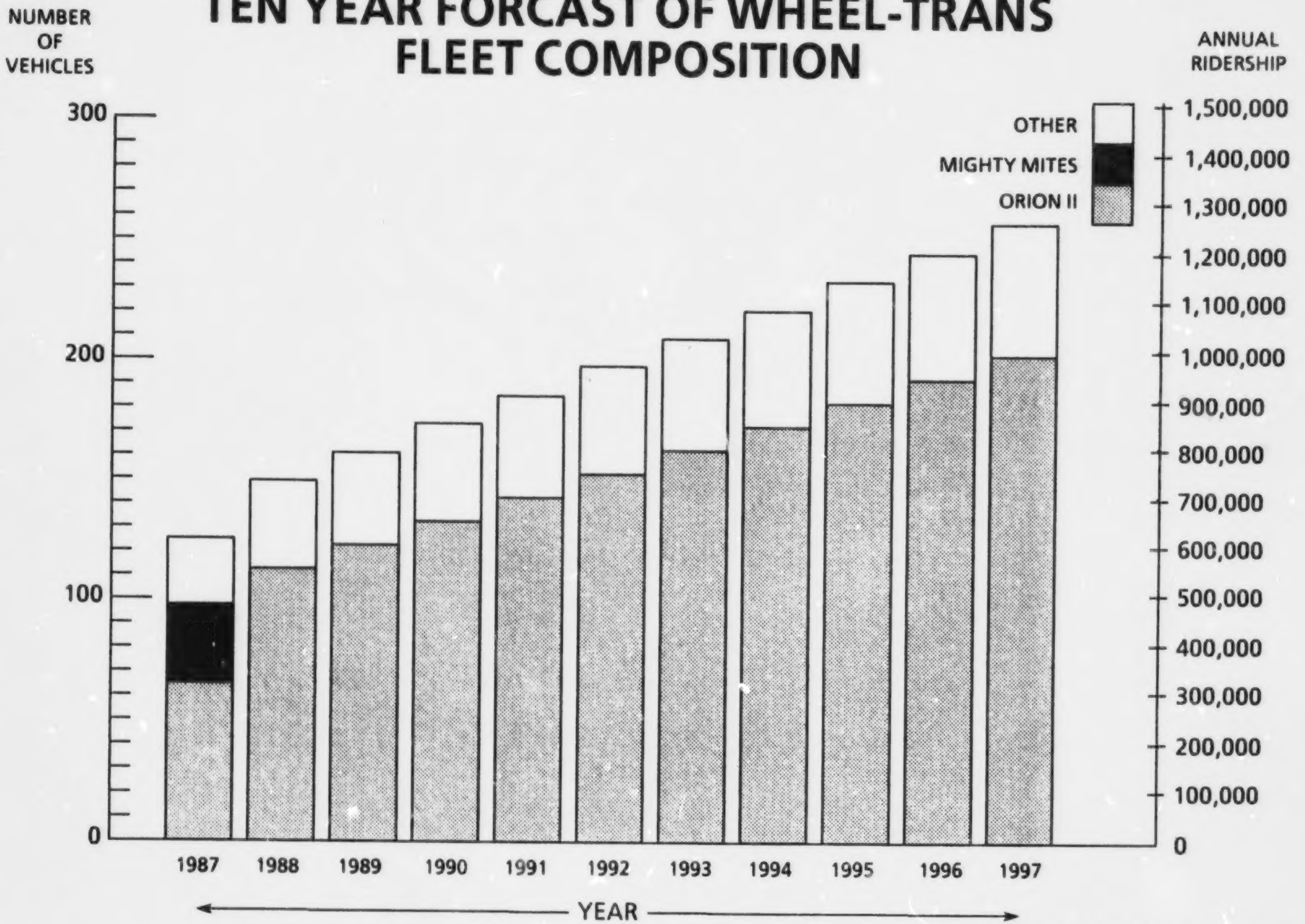
3. The inflated stream was then discounted by the cost of capital (10 percent) and summed to obtain the net present value.

4. The net present value figure was then annualized over the specified time period (10 years).

The Wheel-Trans forecast represented in Exhibit E-1 is the best estimate available at this time. The widening of the eligibility criteria and the increase in the number of elderly will create significant pressure for

Exhibit E-1

TEN YEAR FORCAST OF WHEEL-TRANS FLEET COMPOSITION



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continuing rapid growth in overall demand. Of course, Wheel-Trans is not the only way to meet this demand, and other approaches may well be tested in the future. The regular transit service will be made more accessible, and perhaps concepts like specialized taxi services (which have already been tried here) and user-side subsidies will be examined further. If successful, such measures could complement Wheel-Trans. However, on the basis of performance so far, and the experience in other cities, it seems safe to say that Wheel-Trans will always be the core and foundation of transportation services for the disabled, and that the projected growth to a "mature" Wheel-Trans fleet of about 250 vehicles seems reasonable.

E.4 TTC Operation of Wheel-Trans

If the TTC were to assume total operation of Wheel-Trans after October 1988, the basic strategy would be as follows:

- The TTC would employ enough drivers to carry on the Wheel-Trans operation as of November 1, 1988 under a labour contract with A.T.U. Local 113, to be negotiated;
- Vehicles would be maintained on a temporary basis at the new Arrow Road Bus Garage, which is currently being constructed to house regular TTC buses and will open October, 1988;
- A new Wheel-Trans Garage would be built on the site purchased for TTC use at Sheppard Avenue and Allen Road, to open in April, 1990 (with an EA exemption) or November, 1990 (without an EA exemption); and
- All maintenance and supervision would be to TTC standards and the drivers would wear TTC uniforms.

E.5 Continuing with a Service Contract

If a new contract were arranged through a competitive bid, the following situation would prevail, based on our experience to this point:

- The contract would go to a single firm, with a new operating cost structure as yet undetermined but probably close to existing rates;

- Maintenance requirements on the TTC-owned vehicles would be tightly specified and inspected, requiring major capital investment by the contractor to handle projected growth in fleet size;

- The contract would need to be a long one to amortize the capital facilities required, probably as long as ten years; and

- Overall inspection by TTC staff would be increased compared to the current contract.

E.6 Comparison of the Two Options

If the TTC had been operating Wheel-Trans this year, the total operating cost, not including capital requirements for a garage, would have been $17.5 million, plus about $0.5 million in one-time start-up costs. All-Way will provide the same service in 1987 for $16.2 million, including their capital requirements this year. (Both the TTC and All-Way figures above include the cost of the TTC Wheel-Trans Department, which would carry out the reservations, scheduling, and dispatching functions in either case). Thus the operating cost (exclusive of start-up and capital costs) for the TTC to operate the 1987 level of Wheel-Trans service would be about $1.3 million, or 7 percent, higher than All-Way's current charges. This difference is greater than the $0.6 million difference shown earlier in the Jakobek report as a result of a more detailed estimate of the impact of TTC union work rules and different assumptions with respect to maintenance. On the face of it, then, it would appear that leaving the Wheel-Trans operation and maintenance with a contractor would result in an operating cost saving of 7 percent relative to a TTC takeover, and this saving could be used to provide more transportation service instead of paying for the full TTC operation. This difference would be $1.3 million in 1987 - even before considering capital cost. However, this is a very short-term view, and does not represent a realistic picture for the future. Any future contractor will have significantly higher costs, and as will be shown below, the 7 percent difference would likely disappear.

If the TTC were to assume the entire Wheel-Trans operation, the service would carried out to TTC standards, which are among the highest in the transit industry. Proper maintenance would require capital investment. Four options for TTC maintenance of Wheel-Trans vehicles were evaluated:

1. Acquisition and renovation of an existing All-Way garage facility;

2. Distribution of Wheel-Trans vehicles among existing TTC garages;

3. Construction of a new garage; and

4. Acquisition and renovation of an existing garage (other than All-Way).

Option 1 was rejected as not feasible. The other three options were evaluated over a 25-year amortization period, including both capital and operating cost. The annualized cost of a central garage facility (Option 3) was found to be 14.7 percent less than Option 2 and about the same as Option 4. Option 3 is recommended over Option 4 since a purpose-designed facility would be superior to a renovated one.

Therefore, if the TTC were to operate Wheel-Trans, the most cost-effective approach in the long-run would be to build a garage capable of handling the 1996 projected fleet requirements, i.e. about 250 Wheel-Trans vehicles. The cost of such a facility would be $21.5 million. The option of building a 200-vehicle garage initially, and expanding to 250 vehicles later, was examined, but rejected because the $1 million saving was outweighed by the disruption caused by having to expand the facility while the garage is in full operation.

The next question was how to deal with the capital investment required by a contractor. In any future contract, the maintenance and inspection procedures to be used for Wheel-Trans vehicles would have to be significantly better than have been provided by past contractors. Vehicle maintenance and consequent passenger safety concerns have received a great deal of publicity over the past year, and vehicle inspection had to be significantly increased. Moreover, if the new Orion II vehicles are to achieve their expected life of 12 - 15 years, a substantial on-going commitment to maintenance is needed. Vehicle maintenance can be a significant cost factor in the long run. For instance, if poor maintenance cuts vehicle life to 10 years from the 15 years possible with proper maintenance, the poorly maintained fleet would have to be replaced three times over a 30-year period, and the well-maintained fleet only twice. The replacement cost of the projected 1996 fleet will be $29.7 million (1987 dollars), so the costs involved are significant.

For purposes of comparison, then, it was assumed that a capital investment of $12.5 million would be required by a contractor to meet the tighter maintenance specifications of any new long-term Wheel-Trans contract and to meet future growth in the Wheel-Trans fleet. This assumption will be contentious, but it seemed the only fair way to make a comparison which takes into account the need to provide first-class maintenance facilities for Wheel-Trans vehicles. Otherwise, reduced vehicle life and unattractive and possibly unsafe vehicles would become a hidden cost, not showing up in the comparison. (The approach used in estimating this capital requirement is shown in detail in Chapter 5 and Appendices B, C, D and E).

A ten-year cost comparison was carried out, using the following assumptions:

1. The service levels to be provided for the 1987-1996 period were as shown in Exhibit E-1;

2. The fleet would consist of Orion II's and station wagons only, all owned by the TTC, and all having equal life expectancy under either option; and

3. All calculations were carried out in constant 1987 dollars, using discount rates which netted out the impact of inflation to estimate average annualized costs.

The following assumptions were made in calculating operating and capital costs for TTC operation:

1. Construction of a single maintenance garage capable of storing 250 Wheel-Trans vehicles at a cost of $21.5 million;

2. TTC work rules for calculating driver requirements and labour costs; and

3. Normal TTC staffing levels for maintenance and supervision.

The following assumptions were made to calculate a contractor's capital and operating costs:

1. Capital investment of $12.5 million to bring existing facilities up to an acceptable standard and to provide additional facilities to house an expanded fleet of 250 vehicles;

2. Cost per hour of operation for 1987 as per the existing contract;

3. An additional $100,000 annual cost for Wheel-Trans staff to monitor and audit contract performance; and

4. Assumption of three different scenarios for future wages:

    (i) elimination of TTC/contractor wage gap in five years;

    (ii) elimination of 80 percent of wage gap in five years; and

    (iii) no narrowing of wage gap.

A sensitivity analysis was also carried out with respect to the amortization of capital expenditures. The TTC would build a structure for the long term, and thus would, in principle, tend to use a 40-year amortization for determining equivalent annual costs of capital investment. A private contractor, on the other hand, might try to re-capture the investment quickly, say over the life of a 9-year contract or perhaps more realistically, over a 20-year period. To obtain a fair overview, the cost comparison was made using four different approaches:

(i) Depreciation of costs over the life of the asset (40 years);

(ii) Depreciation of costs over the life of an assumed "contract" of 9 years (1988 - 1996);

(iii) Depreciation of costs over 20 years, a typical period for the private sector; and

(iv) Lump sum capital expenditures in the years in which the expenditures are made (1988 - 1989).

The results of this cost comparison are shown in Exhibit E-2. (Full details are included in Chapter 5 of the report, and Appendices B, C, D and E).

The most realistic basis for comparison is the 40-year amortization, because it best reflects the true economic life of the asset, rather than reflecting accounting or tax law requirements. On this basis, the results of the analysis are as follows:

(i) If the TTC/contractor wage gap were eliminated in five years, the contractor's average costs would be about 2 percent higher than the TTC's over the ten-year period; and

(ii) If there were no narrowing of the wage gap, the contractor's average costs would be about 3 percent lower than the TTC's over the same period.

Exhibit E-2

COMPARISON OF IN-HOUSE AND CONTRACTED COSTS OF OPERATION (1987-1996)[1]

CAPITAL COST ASSUMPTION	TTC	CONTRACTOR		
		ELIMINATION OF WAGE GAP IN FIVE YEARS	ELIMINATION OF 80% OF WAGE GAP IN 5 YEARS (NO PARITY)	NO NARROWING OF WAGE GAP
1. LUMP SUM EXPENDITURE FOR GARAGE IN 1988-89	$28.6	$28.3	$28.1	$26.9
2. DEPRECIATE GARAGE OVER 40 YEARS	$26.4	$27.0	$26.8	$25.6
3. DEPRECIATE OVER 20 YEARS	$26.9	$27.3	$27.1	$25.9
4. DEPRECIATE OVER 9 YEARS	$28.2	$28.1	$27.8	$26.7

FOOTNOTE:

(1) All figures represent the annualized cost (capital and operating) of Wheel-Trans service (millions of 1987 dollars) for the 1987-1996 period.

It can be seen, therefore, that the 7 percent initial cost premium for a hypothetical TTC operation in 1987 would be significantly reduced over a ten year period, to an average of, at worst, 3 percent, and quite possibly would be eliminated entirely. In other words, when total capital and operating costs are compared for a TTC operation versus a contractor operation over a ten year period, the difference ranges from minus two percent to plus three percent - not a significant difference.

E.7 Summary

The following points have been made here:

1. If the TTC were to assume total operation of Wheel-Trans immediately, there would be start-up costs of about $.5 million, and total costs would increase by about 7 percent. On top of that, there would be a capital investment of $21.5 million required for a new 250 vehicle garage within three years;

2. However, this short-term comparison is incomplete. If a private contractor were to continue Wheel-Trans operation and maintenance after 1988, major capital investment would be required - an estimated $12.5 million - to maintain an expanded fleet of TTC-owned Wheel-Trans vehicles to TTC standards. Any new contract would require much more stringent maintenance specification and inspection than previous contracts;

3. When an annualized cost comparison is carried out over the 1987-1996 period, the cost differences become minimal. If a 40-year amortization period is assumed for the capital investments, and if we assume that the wage gap between the TTC and a contracted service will

remain unchanged, then a TTC service would cost - on average - three percent more over the period. If the wage gap were eliminated, TTC operation would be two percent cheaper on average, as the investment in the garage starts to pay off in increased efficiency;

4. On balance, the long-run costs of the two options are likely to be about the same, certainly within plus or minus three percent. This stands to reason, because maintenance and operating standards would be more or less the same; lack of performance in this area - by either party - would not be tolerated. The customer orders, scheduling and dispatching would be handled by the TTC in either case, so aside from the wage rate differences already considered, only two other factors remain which could be different: management quality, and profit margin. Any increased management efficiency by the contractor would become profit; the only other possible source of profit, if everything else is equal, would be reduced quality of service somewhere; and

5. If the average total cost over the 1987 - 1996 period is more or less the same (i.e. within three percent) for a TTC operation or a contractor operation, the choice boils down to differences in product delivery, management style, and, perhaps accountability and control.

E.8 Recommendations

Based on the analysis in this report, it is recommended that the TTC assume all aspects of the Wheel-Trans operation, rather than call new bids for a long-term contract when the current contract with All-Way expires. If TTC management can control costs properly, the analysis indicates that over a ten-year period the true cost difference would be no more than about 3 percent, and probably less. More specifically, it is recommended that the following actions be taken:

1. That the TTC assume full responsibility for the Wheel-Trans service upon termination of the current All-Way contract on October 31, 1988;

2. That the TTC design and construct a new Wheel-Trans garage, with 250 vehicle capacity, on the TTC lands at Allen Road and Sheppard Avenue; and

3. That the necessary minor modifications be made to the new Arrow Road bus garage to accommodate Wheel-Trans vehicles temporarily from October 31, 1988 until the opening of the new Wheel-Trans garage.

There will be some short-term costs involved, and some long-term risks in the investment, since it is based on projections. However, given the demographic trends and recent policy statements from the Province of Ontario, an expanded Wheel-Trans with service and maintenance to TTC standards seems to be the better way to go, even at a slight cost premium.

COST/BENEFIT ANALYSIS OF FULL INTEGRATION OF WHEEL-TRANS

1.0 BACKGROUND

1.1 Introduction

On June 23 and 26, 1987, Metropolitan Council considered a report by TTC Commissioner T. Jakobek entitled "New Directions - A Plan for Enhanced Public Transit Services for the Mobility Disadvantaged." The recommendations contained in the above report were endorsed subject to the following:

(1) requesting the Toronto Transit Commission (TTC) to report on the availability and adequacy of existing facilities, or on the need for new facilities as it relates to the takeover of the Wheel-Trans service by the TTC, such report to address the question of one or more locations for vehicle maintenance and operations; and

(2) receiving a report from the TTC back to the Transportation Committee by the end of October, 1987, on an accurate estimate of costs and a schedule for the takeover of the Wheel-Trans service and that such report address the implications to service levels and standards, including meeting within 2 years, ride shortfalls and the implications of continued service delivery at the conclusion of the current arrangements.

1.2 Purpose of the Report

The purpose of this report is to respond to the above two requests and to provide detailed information concerning the costs and benefits of in-house and contracted operation of Wheel-Trans, the number, type and cost of alternative garage and maintenance facilities and various timing and implementation issues relating to the full integration of Wheel-Trans by the TTC. This report builds on the cost estimates included in Commissioner Jakobek's report and past TTC efforts to quantify the difference in costs between contracted and in-house operations.

1.3 Current Pressures

Although this report is in response to Metro Council's request, the TTC has been concerned about the issue of contracting of Wheel-Trans operations for quite some time. Some of the factors which have influenced the TTC's interest in the role and performance of the contractor in the operation of Wheel-Trans include the following:

(1) A narrowing of the cost gap between contracted and in-house operation.

(2) A need for better control and flexibility in the operation of the service.

(3) Community pressure for continuing the integration process with drivers, provision of facilities and vehicle maintenance.

1.4 Status of Current Contract

The TTC's contract with All-Way Transportation Corporation expires on October 31, 1988. A decision concerning the termination, extension or re-tendering of the contract must be made in the near future to permit the TTC sufficient time to obtain the necessary approvals.

1.5 Organization of the Report

This report discusses the advantages and disadvantages of various options for the continued operation of Wheel-Trans. The report is organized as follows:

Chapter 2 - summarizes the history of Wheel-Trans, the current division of responsibilities between the TTC and the contractor, and forecasted ridership and fleet sizes.

Chapter 3 - discusses the common advantages and disadvantages of contracting out.

Chapter 4 - outlines the current experience with the contractor.

Chapter 5 - provides detailed operating and capital cost estimates for in-house and contracted operation.

Chapter 6 - considers the tangible and intangible benefits of full integration of Wheel-Trans by the TTC in comparison to the identified costs.

Chapter 7 - outlines the alternatives for the provision of maintenance facilities including consideration of financial and operating implications.

Chapter 8 - consideration of various implementation problems including temporary garage facilities and labour relations issues.

Chapter 9 - report conclusions and recommendations.

2.0 HISTORICAL PERSPECTIVE

2.1 Introduction

The division of responsibility between the contractor and the TTC has changed since the Wheel-Trans service was initiated. As well, the fleet composition has changed and significant increases in service levels and ridership have been achieved. The following section describes the history and growth of Wheel-Trans, current responsibilities, and potential ridership and fleet growth in the next decade.

2.2 History of Wheel-Trans Service

In 1973, at the request of Metropolitan Toronto, the TTC was asked to participate in the development of a transportation service for the physically disabled. A pilot project was initiated to serve persons unable to board regular public transit, the cost of which was shared equally by the Province of Ontario and the Municipality of Metropolitan Toronto. The 1975 pilot project involved 7 vans and was operated during peak hours for "work" trips only. The service was expanded in 1977 to include any trip purpose, twelve hours a day, five days a week.

In 1978, a taxi company was contracted to provide a service during weekday peak periods, for ambulatory passengers only. The taxi service grew from 8 vehicles initially to 21 in early 1984.

Gradually, Wheel-Trans service was expanded to include evenings, weekends and holidays. The Wheel-Trans vehicle fleet increased from 7 vehicles initially to 126 vehicles in 1987. In early 1984, all operating vehicles came under one contractor and the taxi cabs were replaced with station wagons.

In April, 1979, Metro Council established a Wheel-Trans Advisory Committee comprised of disabled representatives from each of the area municipalities, Metropolitan Toronto's Social Services and Planning Departments and the TTC. The role of the Advisory Committee and its Sub-Committees was to advise on policies with respect to the Wheel-Trans service and on changes or issues that would affect the rider. The operation and management of the service was the responsibility of the TTC in accordance with the policies and guidelines which were established by the Advisory Committee.

In May 1983, TTC staff assumed responsibility for the reservation, scheduling and dispatching functions in response to community complaints concerning the reservation process. The administrative structure of Wheel-Trans also changed with the TTC's added role. A Wheel-Trans Community Committee was formed in 1984. This committee, reporting directly to the Commission, is comprised of representatives of the disabled community who are passengers on the system. Their role is to provide advice on the general operation of the service and on changes or issues which affect Wheel-Trans customers.

Following the acceptance of the responsibility for scheduling, the TTC installed a computer system which enables staff to store, retrieve and update reservation and schedule information quickly and accurately. Computerization of the dispatch function has recently been completed.

In March 1986, the Commission provided the contractor with 30 Orion II buses to replace a similar number of retiring mini-buses. The TTC is proceeding with further vehicle procurements and by 1988 will own all Wheel-Trans vehicles.

2.3 Current Division of Responsibilities

The current division of responsibilities between the contractor and the TTC is outlined in Exhibit 2-1. The overall management, planning, scheduling, administration and monitoring of Wheel-Trans services rests with the TTC. As well, the TTC has recently assumed responsibility for the purchase of all vehicles. The contractors responsibilities include supply of garage facilities and drivers and the operation and maintenance of vehicles.

2.4 Current and Future Wheel-Trans Service

2.4.1 Introduction

The regular Wheel-Trans service is available within the entire Metropolitan Toronto area. It currently operates Monday to Friday from 6:30 a.m. to 12:00 midnight and Saturdays, Sundays and Holidays from 8:00 a.m. to 12:00 midnight. The fare charged is equivalent to the regular TTC adult fare.

Wheel-Trans operates several types of service: subscription, pre-book, advance reservation, demand response and special services as outlined below:

Subscription:	If a customer travels to and from the same destination four or five days a week (work or education) from Monday to Friday, during the peak hours, he/she is eligible for the service. Trips are pre-scheduled and the vehicle picks up the rider at the same time each day.
Pre-book:	This is similar to subscription, but is for customers who require transportation two or more times a week, to and from the same destination at the same times for dialysis trips.
Advance Reservations:	Advance service is used for casual trips, such as medical appointments, shopping, visiting, etc. Reservations are accepted up to four days in advance.

Exhibit 2-1

CURRENT DIVISION OF RESPONSIBILITIES BETWEEN THE TTC AND THE CONTRACTOR

Contractor

- Supply of garage facilities;
- Operation and maintenance of vehicles;
- Hiring and training of drivers; and
- Labour relations, negotiations and grievances.
- Supply of radio frequency and base station.
- Supply of Mighty-Mites and station wagons.

Toronto Transit Commission

- Reservation, scheduling and dispatching of vehicles.
- Implementation and maintenance of computer programs and facilities;
- Community relations;
- On-street supervision of service;
- Tendering and monitoring of contract and contractor performance;
- Service planning and forecasting;
- Budget and cost analysis;
- Overall management and administration of service; and
- Purchase of all new vehicles.

Demand Response:	This service is offered to riders who need a ride on the same day that they call. The request will only be accommodated provided there is space available on that day's schedule.
Special Services	On a special request basis, Wheel-Trans will also arrange for group or charter services for the disabled community. This service may extend beyond the Metro boundary and is operated on a cost-recovery basis.

2.4.2 Forecast Ridership

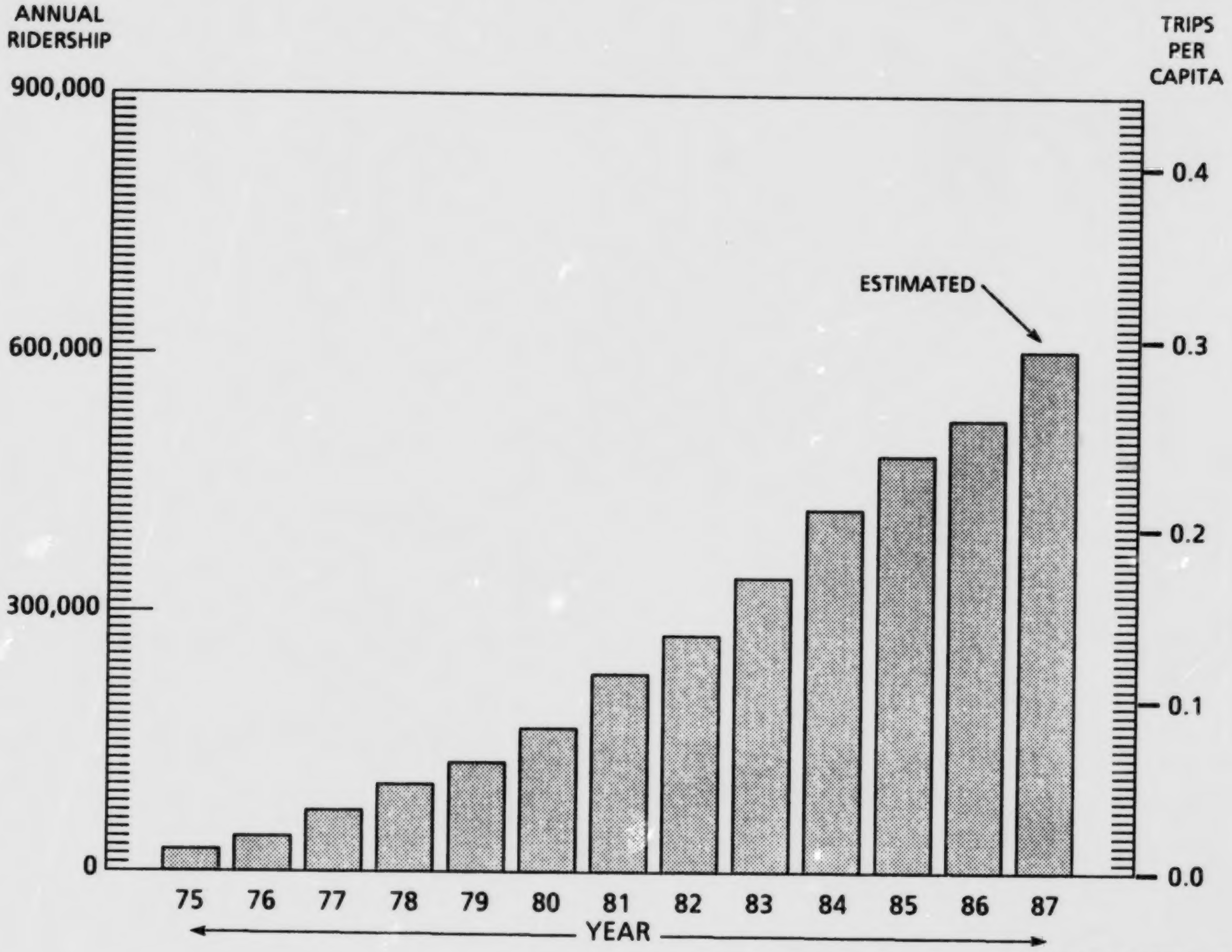
Since its inception, Wheel-Trans ridership has climbed steadily (see Exhibit 2-2). In 1987, it is expected that Wheel-Trans will carry approximately 606,000 passengers.

Several factors indicate that the Wheel-Trans service has the potential to expand beyond its current size. Some of the reasons that will likely lead to continued ridership growth include the following:

- currently 10 percent of all requested bookings cannot be accommodated due to lack of space. It is anticipated that many registered Wheel-Trans users do not attempt to book same day requests in anticipation of being rejected. This would indicate a latent demand over and above the 10 percent of trips which currently cannot be accommodated on the system.
- increasing rate of new registrations;
- continued aging of the population and increased life expectancy;

Exhibit 2 - 2

HISTORICAL GROWTH OF WHEEL-TRANS RIDERSHIP



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- Only 18,500 out of an estimated 33,000 disabled persons in Metropolitan Toronto are registered for Wheel-Trans;

- A projected increase in the annual trips made by disabled persons as they participate in more activities and live at home rather than in institutions; and

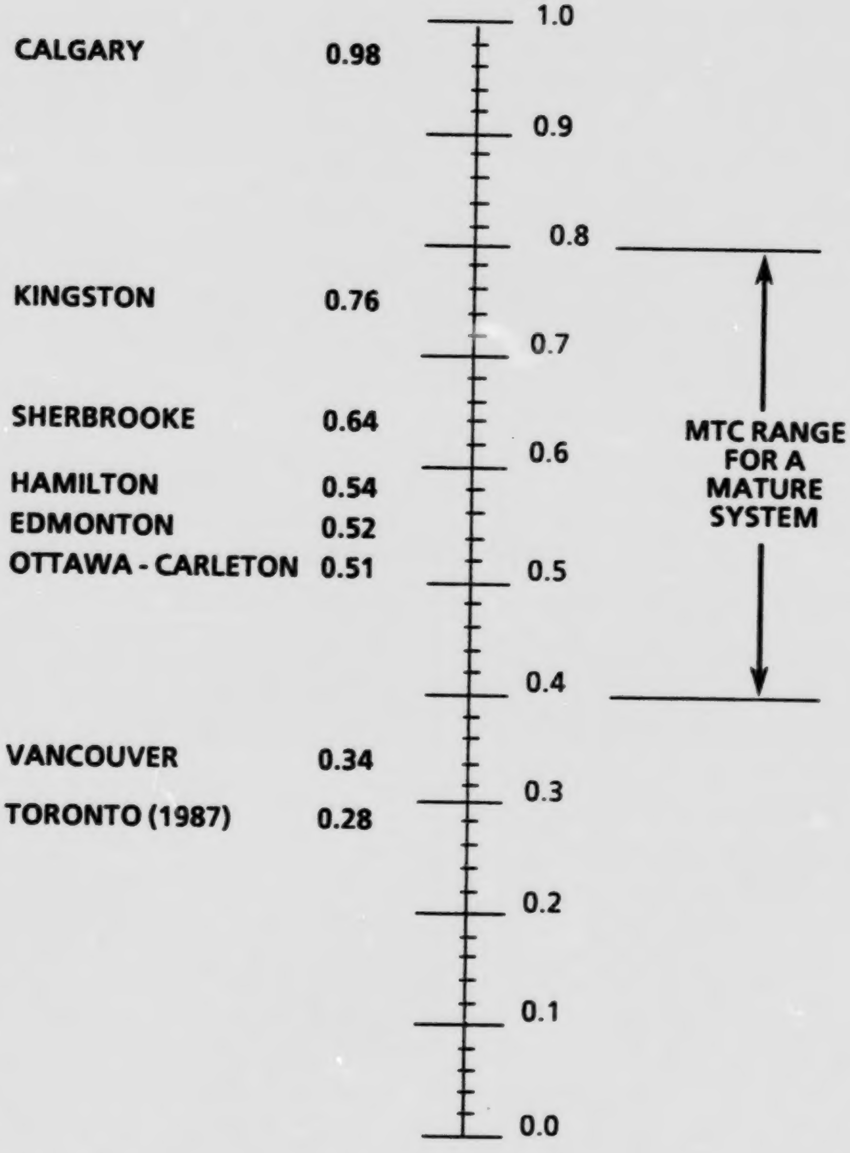
- continued pressure to broaden eligibility criteria to include persons with other disabilities (such as the mentally disabled, epileptics, blind) or persons who are unable to use regular transit.

A report completed by the Ministry of Transportation and Communications estimates that under current eligibility guidelines, a specialized transit system for the disabled should carry in the range of 0.4 to 0.8 annual trips per capita. A mid-range target of 0.6 trips capita represents 1,300,000 trips per year by Toronto's disabled community.

A comparison of the service levels of the various municipalities (on the basis of trips per capita) shows that cities such as Ottawa and Hamilton provide twice the trips per capita of Toronto's Wheel-Trans service. (See Exhibit 2-3) Similarly, the highest ranked municipality in Ontario, Kingston, provided a service level of 0.76 trips per capita in 1986 or three times the current ridership in Metropolitan Toronto. While the ridership per capita experienced in small cities such as Sherbrooke and Kingston is not indicative of the ridership levels that could be experienced in Metro, Ottawa and Hamilton have similar eligibility criteria and service areas and are considered valid targets for future Wheel-Trans ridership levels.

Exhibit 2 - 3

COMPARISON OF RIDES PER CAPITA FOR MAJOR CANADIAN CITIES



NOTE: All statistics are 1986 data unless otherwise indicated

TTC OP 87.09.17 Drg.No. 9453

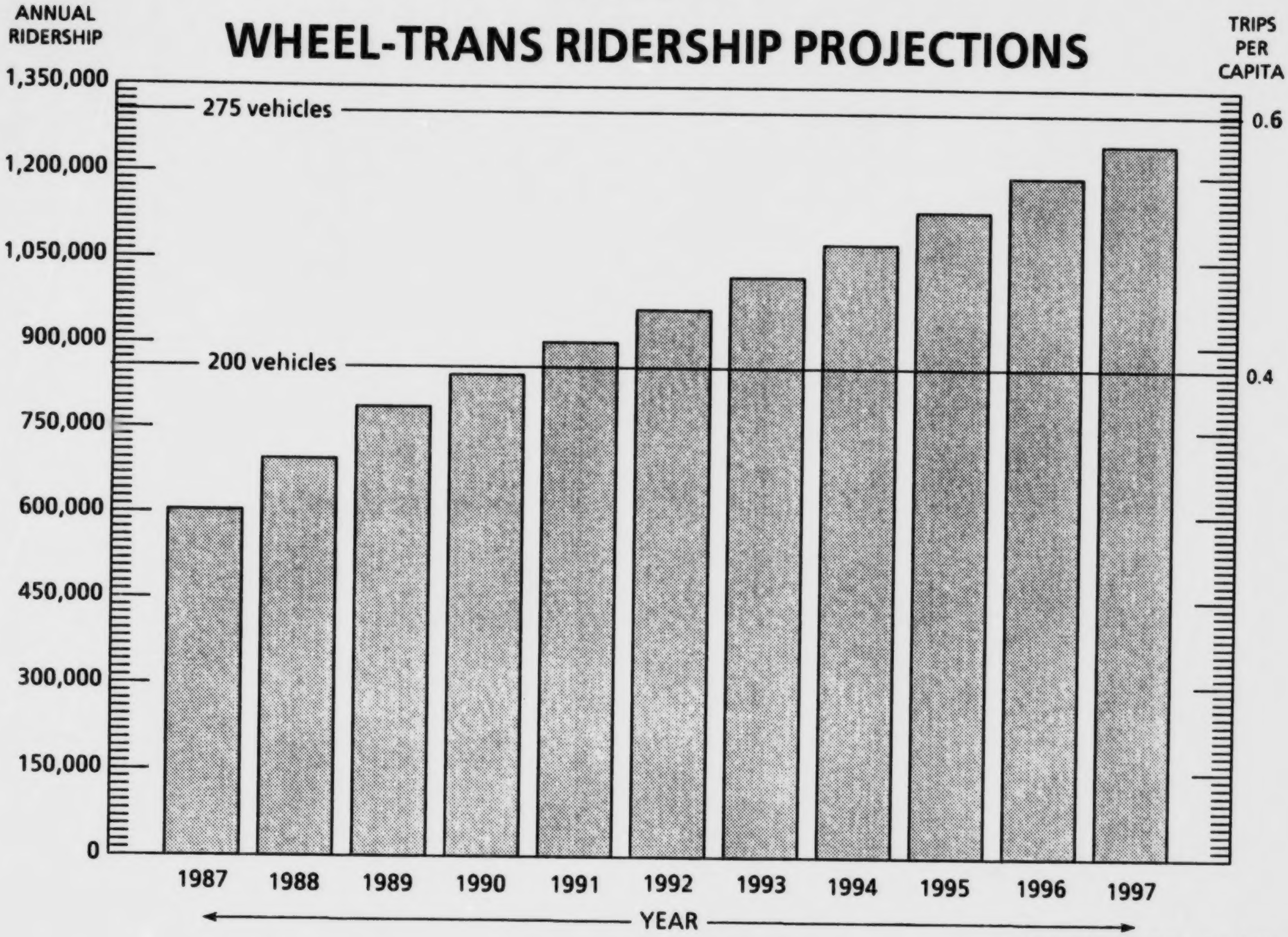
Toronto's 1987 level of 0.28 trips per capita is below the provincial guideline of 0.4 to 0.8 trips per capita for such systems. This comparison indicates that it will take Wheel-Trans some time to reach a "mature" state, with a potential of increasing ridership 2 to 3 times current levels. Based on the current service distribution, to achieve 0.4 trips per capita a fleet of 200 vehicles would be required while ridership levels of 0.6 trips per capita would necessitate a fleet size of 275 Wheel-Trans vehicles (see Exhibit 2-4). Even with continuing plans for productivity improvement, it is estimated that a minimum fleet of 250 vehicles will be required by 1997.

Two key assumptions concerning the above forecasts should be noted. First, the above forecast is based on a continuation of the historical ridership growth with an 11 and 14 percent increase in 1988 and 1989 service levels respectively (to reduce the number of bookings which cannot be accommodated) and annual increases thereafter of 5 to 7 percent. Forecasting ridership levels beyond 1991 is problematic and the achievement of a mature level of ridership is difficult to predict. Unfortunately, more sophisticated forecasting methods cannot be utilized due to the lack of available data. It is hoped that the Federal Health and Disability Survey completed recently will provide detailed information concerning the size of the handicapped population in the greater Toronto area and their trip making characteristics.

Second, there are many factors which could affect Wheel-Trans ridership, service levels and vehicle requirements in the future including full accessibility of the rapid transit system, broadening of eligibility criteria for Wheel-Trans and use of alternative service delivery mechanisms such as taxis or user-side subsidies. Such factors have not been explicitly taken into account in the above forecast as the timing and impact of such changes is not known at this time.

Exhibit 2 - 4

WHEEL-TRANS RIDERSHIP PROJECTIONS



TTC OP 87.09.17 Drg.No. 9450

2.4.3 Forecast Vehicle Requirements

The distribution of the 126 vehicles in the Wheel-Trans fleet as of December 1987 is shown in Exhibit 2-5. Approximately 14 percent of the vehicle fleet is currently devoted to spares for maintenance, training and special service vehicles. By the end of 1987, the majority of the Mighty-Mite vehicles, owned by the contractor, will be retired as they will have exceeded their five year life. Current contractual obligations require that the Might-Mite vehicles be replaced after 60 months of service, while station wagons are replaced after 18 months.

Exhibit 2-6 projects the vehicle fleet size and distribution for the period from 1987 to 1997. These estimates are based on a continuation of the historical growth over the past several years and continued demand for trips to a more "mature" level of ridership as noted previously. A fleet size of 258 vehicles would be required in 1997 comprised of 203 Orion II vehicles and 55 small vehicles. The above fleet size would result in 1.255 million Wheel-Trans rides in 1997 or just under 0.6 trips per capita.

It should be emphasized that the fleet acquisition will provide for TTC ownership of all Wheel-Trans vehicles by the end of the current contract on October 31, 1988. At the TTC's option, these vehicles may then be leased to future contractors or operated by TTC staff. In this manner, the burden of vehicle ownership will not be a factor for potential contractors tendering for future contracts. The foregoing analysis of vehicle requirements has assumed that the current distribution of vehicles throughout the day is maintained.

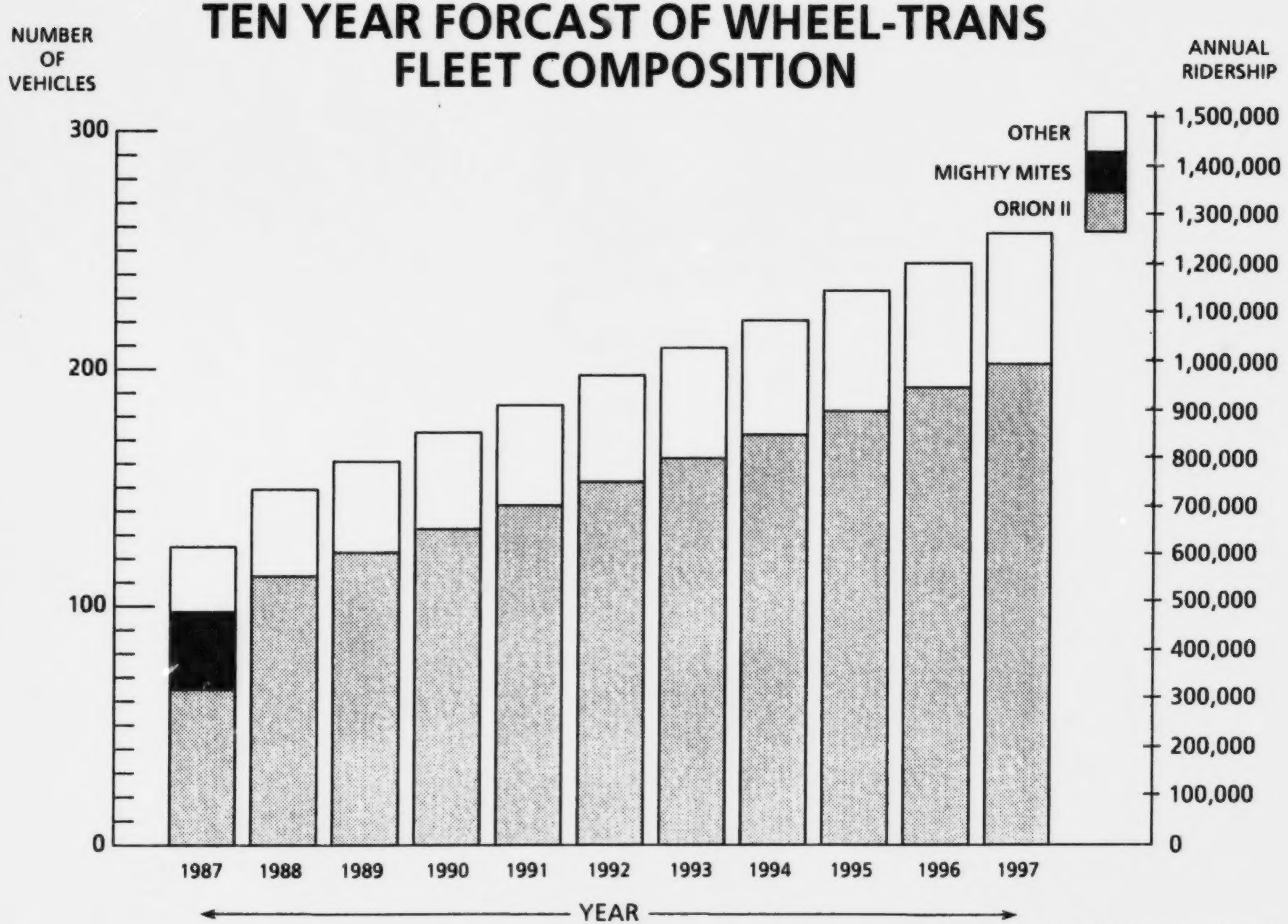
Exhibit 2-5

WHEEL-TRANS VEHICLE FLEET
AS OF DECEMBER, 1987

	Peak Vehicles For Service	Spares for Maintenance & Operations	Total
Small Vehicles			
o Station Wagons	25	3	28
Buses			
o Orion II	65	-	65
o Mighty-Mite/Girandin	18	15	33
Total	108	18	126

Exhibit 2 - 6

TEN YEAR FORCAST OF WHEEL-TRANS FLEET COMPOSITION



TTC OP 87.09.17 Drg.No. 9452

2.5 Summary

Wheel-Trans has experienced sustained growth to date and based on continued ridership growth will achieve ridership of 1,255,000 passengers by 1997 from 606,000 in 1987. This will require an increase in the Wheel-Trans fleet from 126 vehicles to 258 vehicles in the same period.

3.0 MAJOR ISSUES IN THE CONTRACTING OUT OF WHEEL-TRANS

3.1 Introduction

Contracting out of specific projects, on-going services, or specialized functions is not new to the transit industry. A recent report published by the American Public Transit Association (APTA) noted that 48 percent of American transit properties contract out to a private organization some or all of their transit services for the elderly and handicapped. In Canada, contracting of specialized services for the handicapped is also common as one-third of the 300 transit systems operated for disabled persons are privately operated.

Initially, the main reason for the use of private contractors for such services was the experimental nature of the operation. As discussed in Chapter 2, Wheel-Trans was initially conceived as a demonstration project. The future extent and scope of Wheel-Trans was unknown, the type of service to be offered was specialized and the TTC had little experience with this type of service. Consequently, it was decided to contract out the service to a private company.

Since that time, however, Wheel-Trans has evolved and matured and is now a permanent addition to the transportation scene in Metro Toronto. As well, over the past decade, the TTC has become more involved in the administration of the service and has become acutely aware of the inherent advantages and disadvantages of a contracted operation.

With the above in mind, the purpose of this section is to examine and describe the general advantages and disadvantages of contracted operation of transit services. The qualitative criteria used in this section will be useful in evaluating the quantitative impacts (costs, infrastructure requirements, subsidy implications) of in-house and contracted operation.

In discussing the advantages and disadvantages of contracting out, it should be noted that the views of individual organizations on this issue are extremely diverse. Some transit properties have had very positive experiences with private contracting while others are less enthusiastic. There are no general guidelines that can be applied to the applicability of contracting out and each case must be evaluated on its own merits based on local data and experiences.

3.2 Advantages of Contracting Out

The major advantages of contracting out to a private company include potential cost savings, meeting seasonal or specialized needs and the potential for increased operating flexibility. Each of the above advantages and its applicability to the operation of Wheel-Trans is described below:

3.2.1 Cost Savings

Cost-effectiveness appears to be the prime advantage associated with the concept of contracting out. The assumption is that for a variety of reasons including more flexible work rules, lower hourly rates, less costly fringe benefit packages, lower management and administrative costs, higher labour productivity, economies of scale and a profit incentive, private firms are commonly able to deliver the same service at lower cost. Alternatively, private firms can deliver more service at the same cost. In some cases, privatization has substantially reduced the cost of providing certain services compared to the public sector. Wheel-Trans experience suggests that the Commission, its financial partners and the disabled community have benefitted in the past from the private operation of Wheel-Trans. Higher levels of service have been provided with the operation of Wheel-Trans by All-Way Transportation than might have been provided if the TTC had operated the system. However, the differential between the cost of contracted and in-house operation has gradually narrowed through unionization and collective bargaining. In conclusion, as the wage gap between the TTC and the contractor narrows, the principle advantage of contracting out, namely cost savings, will be reduced and/or eliminated.

3.2.2 Specialized Expertise

Traditionally, contracting out of specialized tasks to private companies is common where the expertise is not available as part of the public sector firms on-going function. Such was the case when Wheel-Trans was initiated. Although the TTC had expertise in operating Dial-A-Bus services, it did not have experience in the area of transportation for the disabled. Contracting out eliminated the need for the purchase of specialized equipment that would have duplicated equipment already available in the private sector and the need for extensive training of employees, again duplicating the skills already available from the private sector. Thus, contracting out allowed the Wheel-Trans system to be implemented quickly without long delays for vehicle procurement and employee training. While this was definitely an advantage when Wheel-Trans was conceived, the advantage has been considerably weakened with the Commission's progressively increasing level of involvement in the operation of the system. The TTC has since purchased vehicles, assumed responsibility for reservations, scheduling and dispatching and implemented a disability awareness training program for TTC employees.

3.2.3 Flexibility

The flexibility to implement service changes can be enhanced through contracting out. Due to less restrictive work rules in the private sector, a private company commonly can respond more quickly to market forces. For example, to implement level of service changes, TTC staff must provide the contractor with seven days notice. By comparison, if the TTC were operating the service under its existing collective agreement, a much longer lead time is required. However, a contracted operation can restrict the ability of the contracting agency to implement major service or policy changes. Consequently, the issue of flexibility can be considered both an advantage and a disadvantage in the contracting of a particular function or service.

3.2.4 Volume of Work

When the volume of work is such that it would require a short-term increase in resources to handle, it is often advantageous to contract out the activity regardless of cost, expertise or flexibility advantages. This has not proven to be particularly applicable to the Wheel-Trans situation.

3.3 Disadvantages of Contracting Out

The major disadvantages of contracting out include the following: reduced management autonomy, control and flexibility, the appearance of a lack of commitment to the service by the contracting agency, quality of service concerns, lack of guarantees concerning continuity of service, the cost of administering the contract, union opposition, control over fare revenues, lack of competition for service provision and lower levels of political accountability. Each of the above disadvantages, and its applicability to Wheel-Trans is discussed in the following pages:

3.3.1 Management Autonomy, Control and Flexibility

While contracting out can provide some greater degree of flexibility than in-house operation, use of private contractors often results in the contracting agency (i.e. the TTC) having less direct control over the provision of service. This is especially true of the management of the Wheel-Trans system. TTC management have limited to no control over the daily supervision of operations, safety standards, maintenance and cleaning of vehicles, employee training, labour negotiations, investigation of complaints and accidents, revenue collection, etc. While contract provisions provide TTC management with some control in these areas, the fact remains that the TTC has less direct control over the expenditure of public funds for the Wheel-Trans system than for regular TTC operations.

3.3.2 Political Control

The contracting out of Wheel-Trans also limits the political control which Metropolitan Toronto and the Province can exercise over the service. In this sense, contracting out results in Wheel-Trans being more isolated from its major financial partners. As witnessed by the 1986 strike against the contractor, it would appear that the Provincial Government considers such services to be essential and will not tolerate strike activity. It should be noted, however, that while legislation was passed which ended the most recent strike and the arbitrator decided on the award, there is no direct means for the Province to influence the compensation of a private company such as All-Way. TTC has a contract with All-Way and only by processing an amendment to that contract, can the Province and Metro be in a position to commit additional funding to the contractor which would permit an increase in any compensation package offered during collective bargaining.

3.3.3 Perceptions of Discrimination

Although the TTC and Metropolitan Toronto are fully supportive of the concept of a specialized system for the transportation of the disabled, the contracting out of Wheel-Trans operations has long been considered to be discriminatory by the disabled community. The contracting of Wheel-Trans is viewed by the disabled community as representing a lack of commitment from the TTC and its financial partners to the provision of a high quality of service. The more direct involvement of the TTC in the purchase of vehicles and the integration of the scheduling and dispatching functions has been praised by the disabled community. Since partial integration in May 1983, the TTC has been able to increase productivity by over 25 percent while improving on the quality of service.

3.3.4 Accountability to Users

The additional level of bureaucracy which is created with the contracting out of a service also results in less accountability to the users of the Wheel-Trans system. The investigation of complaints is a particular problem. Due to the multiple layers of responsibility, the investigation of complaints is sometimes time consuming and can result in the appearance that no action is being taken to resolve the concerns of the user. If the TTC were fully responsible for the operation of the service, it is expected that accountability to users would be improved.

3.3.5 Quality of Service

Due to the profit nature and short-term contractual commitment, the reliability, cleanliness, safety and maintenance standards of a private company are perceived by the disabled community to be lower than that of a public organization. Although All-Way has improved the quality of service offered to the public over the past few years, improved quality of service is an on-going concern of TTC management within the terms of the contract agreement. With the purchase of the Orion II vehicles by the Commission, the issue of maintenance standards will be of increasing concern as the Commission has assumed a risk that its vehicles, with service lives of 12-15 years, will be well maintained by the contractor. Finally, as noted earlier it is the view of the disabled community that the TTC can provide a higher quality of service than a contractor and that the current quality of service needs improvement.

3.3.6 Continuity of Service

At present, the TTC has no direct control over the continuity of service provided by the contractor. This is one of the most significant disadvantages of a contracted operation and is one of the reasons why the Commission has moved to purchase its own vehicles. TTC ownership of vehicles reduces the risk of a long service interruption caused by the termination of a contract by either party or the financial collapse of the contractor, as the TTC could quickly provide a minimum level of service with its own vehicles. As most disabled persons do not have alternative modes of transportation available, a prolonged service interruption can cause great personal hardship. Consequently, continuity in the provision of transit services for the disabled is of particular importance. In-house operation would eliminate the risk of a service interruption due to the default of the contractor.

3.3.7 Competition

The type of contract, the need for specialized operating and maintenance facilities, and the hiring and training of an appropriate number of personnel are all barriers to effective competition when tendering the service. In the past, it was always considered that a lengthy lead time would be required when soliciting bids for the Wheel-Trans service, since the successful contractor would have to acquire an appropriate quantity of specialized vehicles in order to run the service. With the Commission moving towards total ownership of all vehicles, this long lead time has been removed along with the necessary capital funds required for vehicle acquisition. However, the tendering time must still allow for acquisition of a building and maintenance facilities. This will be difficult for a contractor in the future as the Wheel-Trans fleet grows and suitable parcels of land become more difficult to find.

Nevertheless, the above barriers can lead to only one supplier being capable and interested in providing the service and leave the contracting agency (i.e. the TTC) with little choice but to renew the contract without the benefit of competitive tenders. As the cost savings resulting from a competitive bidding process is one of the major advantages of contracting out, the lack of private sector competition with All-Way may seriously hinder the gains to be obtained through continuing to contract with a private sector company.

3.4 Summary

In summary, there are both advantages and disadvantages to the contracting out of services and functions. Wheel-Trans is a classic example of a service that was contracted out initially for very obvious reasons. As the service matured, some of the initial reasons for contracting out have become less important and the TTC's experience with contracted operations has resulted in the disadvantages being more clearly recognized. The following chapter outlines the current experience with the contractor from the perspective of the disabled community and the TTC.

4.0 CURRENT EXPERIENCE WITH THE CONTRACTOR

4.1 Introduction

Over the past twelve years, the Wheel-Trans service or portions of it have been operated by various contractors including Metro Cab, Atlantic, Wheel-Chair Mobile Services and All-Way Transportation Corporation. During this time period, one contractor went bankrupt and another contractor changed ownership. Both events were disruptive to the quality and quantity of service provided. As the end of the current contract nears, further disruption of service is possible if a new contractor is successful in obtaining the contract. The current operator, All-Way Transportation, has operated the service longer than any other operator and by the time the current contract ends in October 1988, will have been in place for a total of eight years.

During this time period, the Wheel-Trans service has grown dramatically, scheduling productivity has increased and the operations have been improved from all perspectives. However, difficulties still exist in terms of improving the quality of the service and effecting changes as a result of the contractor/TTC relationship.

4.2 Perspective of the Disabled Community

Letters and phone calls from customers and comments from Wheel-Trans customer surveys show that the disabled perceive the quality of the contracted service to be below that of TTC standards. During the first six months of 1987, Wheel-Trans users registered a total of 495 operations related complaints. Of these, 60.5 percent were directly related to the contractor's performance (see Exhibit 4-1).

Exhibit 4-1

BREAKDOWN OF OPERATIONAL COMPLAINTS FOR THE FIRST SIX MONTHS OF 1987

Nature of Complaint	Number	Percent	Contractor Responsibility (%)	Contractor Complaints Percent (%)
Vehicle did not show up.	87	17.6	60	10.6
Vehicle late.	59	11.9	70	8.3
Discourteous driver.	55	11.1	100	11.1
Trip information incorrect.	48	9.7	-	-
Telephones busy.	37	7.5	-	-
Vehicle operation.	31	6.3	100	6.3
Handling of passengers	28	5.7	100	5.7
Vehicles (maintenance).	28	5.7	100	5.7
Late callbacks.	21	4.2	-	-
Seatbelts	18	3.6	100	3.6
Vehicle left early.	15	3.0	100	3.0
Delays.	14	2.8	50	1.4
Vehicle early.	13	2.6	100	2.6
No record of booking.	13	2.6	-	-
Fare dispute.	9	1.8	100	1.8
Vehicle cancelled but came anyway.	9	1.8	-	-
Discourteous dispatch assistant.	8	1.6	-	-
Smoking.	2	0.4	100	0.4
TOTAL	495	100.0%	N.A.	60.5%

NOTES:

1. Above does not include complaints on "unable to be accommodated at times requested" or "on vehicle too long" as these are related primarily to availability of service hours and budgets rather than operations. Also does not include "miscellaneous" complaints.

The current level of complaints by Wheel-Trans users represents 600 rides per complaint compared to 46,000 rides per complaint for the regular TTC system. Given the above, it is no surprise that the disabled community has advocated that the service be integrated and operated by the TTC.

Specific concerns of the disabled community concerning the performance of the contractor, as expressed in recent complaints and the Wheel-Trans customer survey, include the following:

- discourtesy of drivers;
- driver familiarity with the city;
- handling of passengers;
- cleanliness, comfort and safety of vehicles; and
- reliability of service.

4.3 TTC Management Perspective

Some of the major difficulties TTC management currently faces with the contractor include the following:

- ° insufficient training in terms of disability awareness and proper defensive driving techniques;
- ° a lack of knowledge of the city by drivers;
- ° higher turnover of contractor's operational staff;
- ° a lack of flexibility and higher costs for advance notice when adjusting service on less than 7 days notice to meet daily demand fluctuations;
- ° an increase in the administrative staffing and overhead costs of the contractor and continuing pressure for wage parity by the contractor's drivers;

- questionable maintenance practices and potential impact on Commission-owned vehicles and outdoor storage of vehicles in winter months; and
- long lead times and negotiating times required to implement operational changes.

In spite of these difficulties, it is felt that the contractor's performance, although not ideal, has improved. Even so, the Commission, by the end of 1988 will have a $14.5 million investment in vehicles. Proper maintenance of these vehicles is essential if their life expectancy is to be attained. At a capital cost of $140,000 per bus, the Orion II is designed to last 12-15 years in revenue service. TTC staff are well aware from the experience of other transit properties of the impact of substandard maintenance practices on vehicle life. The contractor's ability to maintain the Wheel-Trans fleet to TTC standards is increasingly being questioned.

As well, major difficulties still exist in ensuring continued delivery of the service and in minimizing disruptions to users when changing contractors. Even with TTC ownership of vehicles, the number of companies with the financial capability to bid on future Wheel-Trans contracts has diminished in the past five years. Without competing tenders the apparent financial advantage of contracting out will likely disappear.

4.4 Summary

In summary, despite a comprehensive contract and extensive monitoring, TTC staff continue to experience problems with the contractor's performance. Of particular concern is the ability of the contractor to maintain TTC-owned vehicles.

5.0 COMPARISON OF IN-HOUSE AND CONTRACTING COSTS

5.1 Introduction

Given the current problems with the contractor, the perspective of the disabled community and Metro's request for a detailed estimate of costs, a detailed costing exercise was conducted to estimate the difference between the cost of contracting out and the cost of TTC in-house operation. Although comparative operating costs are relatively easy to calculate, the need to include the costs for garage and maintenance facilities in the event of TTC operation and the construction of new and improved garages in the event of continued contracting out makes direct cost comparisons difficult.

The need, justification and alternatives for the provision of garage and maintenance facilities are considered separately from operating costs. However, in assessing the overall costs and benefits, all capital costs are annualized and added to annual operating costs to obtain a single figure for comparison purposes. As well, rather than examine the cost of operation in a particular year, the following analysis examines the operating and capital costs for the period from 1987 to 1996. This method of examining the cost implications of contracted and in-house operation of Wheel-Trans differs from the analysis included in the Jakobek report. The Jakobek report examined the comparative cost of operating Wheel-Trans in a given year (1987) and did not take into account potential changes in operating costs over an extended period of time, potential capital costs incurred by the contractor or the effect of economics of scale. These factors are examined in detail in this chapter.

5.2 Operating Cost Estimates

5.2.1 Assumptions and Service Levels

In order to provide a reasonable basis on which to compare the current cost of contracting Wheel-Trans service with a scenario wherein the TTC totally provides the service, a variety of assumptions had to be made that could be applied to both scenarios. First, it has been assumed that a vehicle fleet consisting solely of Orion II vehicles and a smaller vehicle will be used to provide service. During 1987, the contractor will still be operating Mighty-Mite vehicles wherein the rate charged to the Commission includes the capital cost of such vehicles. Due to the pending retirement of the Mighty-Mites, the operating cost analysis does not include a scenario involving Mighty-Mites.

Second, the TTC expects in the near future to purchase small vehicles having wheelchair capability in order to replace the existing station wagons. Since the maintenance and operating costs of these proposed new vehicles are currently unknown, it is considered more useful to use the contractor's known costs for the station wagons in comparison to the estimates of TTC costs for the same vehicle.

Third, both in-house and contracted operating cost estimates are based on the service levels outlined in Exhibit 5-1. The year 1987 was chosen as the base for the comparison of in-house and contracted operation of Wheel-Trans as this is the period for which there is confirmed and accurate financial information. The assumption of 1988 or 1989 as the base year could have adversely affected the base upon which operating costs in future years would be calculated. 1996 was chosen as the target year as it is estimated that Wheel-Trans will reach a level of maturity in that year (see Chapter 2).

EXHIBIT 5-1

ASSUMED SERVICE LEVELS (1987-96)(1)

VARIABLE	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Vehicles										
Orion II	99	113	123	133	143	153	163	173	183	193
Other	27	37	39	41	43	45	47	49	51	53
Total	126	150	162	174	186	198	210	222	234	246
Percent Change		19.0	8.0	7.4	6.9	6.5	6.1	5.7	5.4	5.1
Service Hours(2)										
Orion II	270,900	309,032	333,762	360,334	386,906	413,478	440,050	466,622	493,194	519,766
Other	59,100	56,056	81,120	85,280	89,440	93,600	97,760	101,920	106,080	110,240
Total	330,000	365,088	414,882	445,614	476,346	507,078	537,810	568,542	599,274	630,006
Percent Change		10.6	13.6	7.4	6.9	6.5	6.1	5.7	5.4	5.1

FOOTNOTES:

(1) As per forecast outlined in Chapter 2.

(2) Service hours are directly proportional to service mileage and ridership.

Fourth, although the need and cost for a TTC garage and maintenance facility is discussed separately in Chapter 7, certain assumptions have been made concerning the staffing levels and costs of operating and maintaining a TTC garage. For purposes of comparison to the contractor, a single TTC garage capable of handling 250 vehicles has been assumed. Certain assumptions have also been made concerning the capital expenditures that would be required of the contractor if the contract was extended. In the consideration of alternative TTC garage scenarios (Chapter 7), the differences in staffing levels for single and multiple garage facilities is considered in detail.

5.2.2 Cost of TTC Operation of Wheel-Trans

In the event of TTC operation of Wheel-Trans, additional administrative staff would be required as well as the hiring of drivers and maintenance personnel.

(a) Transportation - In terms of driver requirements, the contractor currently employs 230 operators (full and part-time). Approximately 99 operators per day are required to cover a total of 123 daily vehicle runs (Orion II's and station wagons). To estimate the number of drivers required in 1987 if the service was operated by the TTC, it was assumed that operators would be working under TTC work rules (Local 113 Collective Agreement). As the contractor currently utilizes part-time drivers and 13 hour shifts at a considerable cost savings, assumption of TTC work rules for the entire 1987-96 period represents the highest cost scenario that can be assumed for TTC operation of Wheel-Trans.

Operator requirements were calculated by dividing annual hours of service by the annual service hours per operator (1,820). The above figure was then adjusted upwards by 10 percent to account for "reportmen" and vacation swing operators. Based on the above, the following operator requirements were established for 1987:

182	Base operators
18	Reportmen and vacation swing operators
200	Total

Assuming an hourly rate of $15.02 and taking into account base wages, premiums, vacations and employee benefits, the estimated transportation related costs in 1987 are $7,611,300.

(b) Administrative Staff - To provide proper on-street service, inspection and management of drivers as well as assume operational and clerical responsibilities currently performed by the contractor, the following additional administrative staff are required based on 1987 service levels:

Number	Position
8	Inspectors(1)
1	Assistant Superintendent - Operations
1	Assistant Office Supervisor
3	General Office Clerks
6	Divisional Garage Clerks
19	Total

In terms of 1987 annual costs, the above administrative staff would cost $734,900.

(c) Plant Operating Costs for Garage - The estimated cost of operating a Wheel-Trans garage is based on a percentage of the 1986 actual operating cost for Malvern Garage. It is assumed that, in terms of office and maintenance space, a Wheel-Trans garage would be approximately 75 percent of the size of the TTC's Malvern Garage. Based on the above, the cost of maintaining a garage including janitorial service, heating, hydro, water, all building trades and employee benefits is $600,000.

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(1) Increased on-street supervision is considered essential to improved quality of service. As well, the above additional inspectors would assume responsibilities currently carried out by the contractor including accident and safety investigations and ensuring compliance with TTC operational standards.

(d) Equipment Maintenance Costs - Manpower and equipment requirements were developed for the maintenance of Wheel-Trans vehicles under the following assumptions:

- All maintenance activities would be carried out at the new Wheel-Trans facility except for some engine and transmission work, accident repairs, brake work and small component overhauls. The above activities would be performed at other TTC locations.
- 13 percent of the fleet would be spares for maintenance and operations.(1)

Manpower was developed to provide coverage at the garage location on a 24-hour, 7-day a week basis with minimum staff in off-peak periods and during weekends. It is estimated that the following staffing would be required in 1987:

44 - Mechanics
1 - Supervisor
3 - Foremen
1 - Clerical
1 - Technical Assistant (part-time)
50 - Total

Based on the above level of coverage, and appropriate wages and benefits for maintenance staff, maintenance of vehicles is expected to be $1,930,600 in 1987. Towing costs, the cost of maintenance materials and management and administration bring the total vehicle maintenance cost in 1987 to $2,477,000.

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(1) This represents a reduction in the spares ratio compared to the current contractor. See Chapter 6 for further details.

It should be emphasized that the number of maintenance staff required for TTC operations represents a major increase compared to the current contractor due to the contractor's practice of contracting out of maintenance activities (including washing of vehicles, body repairs, engine/transmission re-building and major accident repairs) and the substantial improvement in maintenance standards that is required.

(e) Licences and Fuel - Licenses for the 1987 fleet is estimated to cost $16,900 while fuel (based on TTC tender prices) is estimated to cost $1,027,000 for a total of $1,043,900.

(f) Start-up Costs - A number of one-time start-up costs have been assumed for 1987 including the following:

- Spare parts - initial stocking of spare parts including a spare Orion II power module ($187,200);
- Uniforms - 200 TTC uniforms for drivers ($100,000);
- Fare Collection Equipment ($7,000); and
- Training - costs of $228,500 are included for preparation of training material and extensive training of operating personnel by the TTC's Operations Training Centre and Wheel-Trans staff. Refresher driver training would include a 5-day course in such areas as defensive driving, sensitivity awareness, radio communication procedures, route training specific to Wheel-Trans and TTC policies and procedures.

(g) Insurance and Taxes - Insurance of vehicles and property against damage and indemnity is estimated to cost $434,000 in 1987 while realty and property taxes for a garage/office facility is expected to cost $1,000,000 per year.

(h) Miscellaneous Costs - Other miscellaneous operating costs include the following:

- TTC Administrative Fee - for work performed by TTC staff in Departments other than Wheel-Trans ($211,700) such as planning, budgetting, payroll processing, etc. The above was calculated using Gray Coach Lines as a base.
- Residual value of station wagons to buy out of current lease ($148,800).(1)
- Maintenance of radio system ($15,000).

The above direct operating and maintenance costs total $14,799,300 based on 1987 service levels. When the cost of the Wheel-Trans Department (reservation, scheduling, dispatching, community relations) is added ($3,206,500) the total operating cost increases to $18,005,800 for 1987.

(i) Projection of Future Wheel-Trans Costs - The above cost of $18.0 million for operation of Wheel-Trans by the TTC in 1987 was used as the base for projecting costs to 1996. Assuming the identified growth in service to 1996, the cost of TTC operation rises from $18.0 million in 1987 to $29.9 million in 1996 (See Exhibit 5-2).

Several changes in costs over this period are worth noting:

- property taxes for a maintenance and garage facility remain constant;

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(1) The TTC Capital Budget calls for the purchase of new specialized vehicles in 1988 rather than leasing station wagons. This cost is included for comparison purposes to account for the fact that the contractor currently supplies the station wagons.

Exhibit 5-2

WHEEL-TRANS 10-YEAR FORECAST OF OPERATING COSTS(1)

OPERATING COST ITEM	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Costs										
Transportation	$7,611,300	$8,479,000	$9,564,300	$10,272,100	$10,980,900	$11,694,700	$12,408,100	$13,115,400	$13,823,600	$14,528,600
Administration	734,900	743,000	751,100	759,200	767,300	775,400	783,600	791,800	800,000	808,400
Plant Maint.	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000
Equipment Maint.	2,477,000	2,603,000	2,729,000	2,855,000	2,981,000	3,107,000	3,233,000	3,359,000	3,485,000	3,608,000
Licence	16,900	18,900	20,900	22,900	24,900	26,900	28,900	30,900	32,900	35,000
Fuel	1,027,000	1,144,100	1,290,500	1,386,000	1,481,600	1,577,900	1,674,200	1,769,600	1,865,200	1,960,300
Start-up:										
- Spare Parts	187,200	--	--	--	--	--	--	--	--	--
- Uniforms	100,000	11,000	114,000	9,000	109,000	9,000	109,000	9,000	109,000	9,000
- Fareboxes	7,000	1,300	700	700	700	700	700	700	700	700
- Training	228,500	24,200	30,800	19,800	19,800	19,800	19,800	19,800	19,800	19,800
Insurance	434,000	516,500	557,800	599,100	640,400	682,000	723,600	764,800	806,100	847,200
Property Tax	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
TTC Admin. Fee	211,700	235,800	266,000	285,700	305,400	325,200	345,000	364,700	384,400	404,000
Station Wagon Lease	148,800	203,900	214,100	224,500	236,000	247,800	257,700	268,000	278,700	289,900
Radio Maint.	15,000	16,400	17,100	17,700	18,300	18,900	19,500	20,100	20,700	21,200
Sub-Total	14,799,300	15,597,100	17,156,300	18,052,000	19,165,300	20,085,300	21,203,100	22,113,800	23,226,100	24,131,300
Wheel-Trans Dept.	3,206,500	3,491,500	3,776,500	4,061,500	4,346,500	4,631,500	4,916,500	5,201,500	5,486,500	5,771,700
TOTAL	18,005,800	19,088,600	20,932,800	22,113,500	23,511,800	24,716,800	26,119,600	27,315,300	28,712,600	29,903,000

FOOTNOTE:

(1) 1987 dollars.

- initial start-up costs in 1987 are reduced substantially in future years. The initial stocking of spare parts is eliminated in future years (on-going supply of parts is included in equipment maintenance costs) while the cost of uniforms, fareboxes and training reflects the increases in fleet size and manpower only;
- the cost of equipment maintenance and administration does not increase in direct proportion to fleet size due to the achievement of economies of scale. For example, the number of administrative and clerical staff for the garage remains constant regardless of fleet size; and
- maintenance of the garage itself does not change over the identified period.

The effect of the above is to make the operation of Wheel-Trans by the TTC more cost-effective over time.

5.2.3 Cost of Contracted Operation

Although the same service levels used to calculate TTC operating costs can be used to estimate the cost of contracted operation of Wheel-Trans, several key factors will affect the cost of a contracted service. First, since Amalgamated Transit Union - Local 113 represents both TTC and All-Way employees, will there be continued pressure for parity in terms of wages, benefits, and working conditions? Second, if the union is successful in narrowing the wage gap between the TTC and All-Way (currently $3.65 per hour) will the entire gap eventually disappear or will some differences remain? Third, how quickly will the gap be narrowed?

Due to the uncertainty surrounding the above issues and the difficulty in predicting future tender prices, the analysis of contracted operation based on a single scenario is not reasonable and would be unfair to the contractor. As a result, three options for the contracted cost of Wheel-Trans operation have been developed:

1. Elimination of the entire wage gap between the TTC and All-Way within 5 years (1991);
2. Elimination of 80% of the wage gap within 5 years (1991) and maintenance of a 20% differential for the remaining years (1992-96); and
3. No narrowing of the wage gap in the 1987-96 period.

The above scenarios for contracted operation of Wheel-Trans translate into annual costs of $16.2 million in 1987 increasing to between $30.5 and $32.8 million in 1996 (See Exhibits 5-3, 5-4 and 5-5). In all three scenarios the cost of the Wheel-Trans Department is the same as for the TTC cost analysis described previously. However, additional TTC staff costs are included for contracted operation to monitor and audit contractor performance. This is based on the assumption that future contractors would be required to meet stringent maintenance, safety and operational standards for the operation of the TTC-owned vehicles. These standards would be specified in detail in all future contractual arrangements for the operation of Wheel-Trans and additional TTC staff would be required to ensure contractor compliance with such provisions.

It should be noted that the above cost estimates assume that the cost per hour rates presently in effect will remain unchanged over the next ten years (other than additional capital costs and elimination of the wage gap). As well, while it is assumed that the TTC will achieve some economies of scale over time, no equivalent assumption is made that a contractor's costs may similarly decrease over time. This is mainly a result of the fact that more detailed examination of TTC costs in future years was possible and

EXHIBIT 5-3

ALL-WAY 10-YEAR FORECAST OF OPERATING COSTS - ELIMINATION OF WAGE GAP IN FIVE YEARS

ALL-WAY COST	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Service Hours										
Orion II	270,900	309,032	333,762	360,334	386,906	413,478	440,050	466,622	493,194	519,766
Other	59,100	56,056	81,120	85,280	89,440	93,600	97,760	101,920	106,080	110,240
Total	330,000	365,088	414,882	445,614	476,346	507,078	537,810	568,542	599,274	630,006
Percent Change		10.6	13.6	7.4	6.9	6.5	6.1	5.7	5.4	5.1
Cost/Hour										
Orion II	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)
Other	29.168	29.168	29.168	29.168	29.168	29.168	29.168	29.168	29.168	29.168
Sub-Total	12,892,223	14,375,504	16,126,114	17,342,937	18,559,760	19,776,582	20,993,405	22,210,228	23,427,050	24,643,873
Effect of Narrowing of Wage Gap(2)	--	266,514	605,727	975,894	1,390,930	1,850,834	1,963,096	2,075,178	2,187,350	2,299,521
Wheel-Trans Dept.	3,206,500	3,491,500	3,776,500	4,061,500	4,346,500	4,631,500	4,916,500	5,201,500	5,486,500	5,771,700
Additional Admin. Costs(3)	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
TOTAL(4)	$16,198,732	$18,233,518	$20,608,341	$22,480,331	$24,397,190	$26,358,916	$27,972,911	$29,586,906	$31,200,900	$32,815,094

FOOTNOTES:

(1) Includes body repair allowance of $0.263 per hour for Orion II vehicles.

(2) Wage gap of $3.65 per hour eliminated in 1992.

(3) To monitor and audit contractor performance.

(4) 1987 dollars.

EXHIBIT 5-4

ALL-WAY 10-YEAR FORECAST OF OPERATING COSTS - ELIMINATION OF 80% OF WAGE GAP IN FIVE YEARS (NO WAGE PARITY)

ALL-WAY COST	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Service Hours										
Orion II	270,900	309,032	333,762	360,334	386,906	413,478	440,050	466,622	493,194	519,766
Other	59,100	56,056	81,120	85,280	89,440	93,600	97,760	101,920	106,080	110,240
Total	330,000	365,088	414,882	445,614	476,346	507,078	537,810	568,542	599,274	630,006
Percent Change		10.6	13.6	7.4	6.9	6.5	6.1	5.7	5.4	5.1
Cost/Hour										
Orion II	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)
Other	29.168	29.168	29.168	29.168	29.168	29.168	29.168	29.168	29.168	29.168
Sub-Total	12,892,223	14,375,504	16,126,114	17,342,937	18,559,760	19,776,582	20,993,405	22,210,228	23,427,050	24,643,873
Effect of Narrowing of Wage Gap(2)	--	266,514	605,727	975,894	1,390,930	1,480,667	1,570,405	1,660,142	1,749,880	1,839,617
Wheel-Trans Dept.	3,206,500	3,491,500	3,776,500	4,061,500	4,346,500	4,631,500	4,916,500	5,201,500	5,486,500	5,771,700
Additional Admin. Costs (3)	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
TOTAL(4)	$16,198,732	$18,233,518	$20,608,341	$22,480,331	$24,397,190	$25,988,749	$27,580,310	$29,171,870	$30,763,430	$32,355,190

FOOTNOTES:

(1) Includes body repair allowance of $0.263 per hour for Orion II vehicles.

(2) 80% of wage gap of $3.65 per hour eliminated in 1992. 20% gap maintained for 1992-1996 period.

(3) To monitor and audit contractor performance.

(4) 1987 dollars.

EXHIBIT 5-5

ALL-WAY 10-YEAR FORECAST OF OPERATING COSTS - NO NARROWING OF WAGE GAP

ALL-WAY COST	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Service Hours										
Orion II	270,900	309,032	333,762	360,334	386,906	413,478	440,050	466,622	493,194	519,766
Other	59,100	56,056	81,120	85,280	89,440	93,600	97,760	101,920	106,080	110,240
Total	330,000	365,088	414,882	445,614	476,346	507,078	537,810	568,542	599,274	630,006
Percent Change		10.6	13.6	7.4	6.9	6.5	6.1	5.7	5.4	5.1
Cost/Hour										
Orion II	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)	41.227(1)
Other	29.168	29.168	29.168	29.168	29.168	29.168	29.168	29.168	29.168	29.168
Sub-Total	12,892,223	14,375,504	16,126,114	17,342,937	18,559,760	19,776,582	20,993,405	22,210,228	23,427,050	24,643,873
Effect of Narrowing of Wage Gap(2)	--	--	--	--	--	--	--	--	--	--
Wheel-Trans Dept.	3,206,500	3,491,500	3,776,500	4,061,500	4,346,500	4,631,500	4,916,500	5,201,500	5,486,500	5,771,700
Additional Admin. Costs(3)	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
TOTAL(4)	$16,198,732	$17,967,004	$20,002,614	$21,504,437	$23,006,260	$24,508,082	$26,009,905	$27,511,728	$29,013,550	$30,515,573

FOOTNOTES:

(1) Includes body repair allowance of $0.263 per hour for Orion II vehicles.

(2) No narrowing of wage gap.

(3) To monitor and audit contractor performance.

(4) 1987 dollars.

that the hourly rate was the only possible way of estimating future contractor costs.

5.2.4 Capital Cost Estimates

The treatment of capital costs poses a difficult problem due to the fact that the TTC has no infrastructure in place to service, maintain and store Wheel-Trans vehicles while the contractor has existing facilities, the cost of which is included in the cost per hour charged to the TTC.

(a) TTC Capital Costs - For the purposes of this analysis, the cost of a single Wheel-Trans garage capable of storing 250 vehicles is estimated to be $18,300,000 plus property costs of $1,649,000.(1) The cost of a new radio system is estimated to be $560,000 including base equipment and on-board radios.(2)

Capital costs to equip a new garage with specialized tools and equipment to be able to operate a Wheel-Trans division was estimated at $969,000.(2) This estimate includes all shop equipment and furniture for all departments but does not include the cost of specialized equipment such as computers. The total capital cost required for TTC operation of Wheel-Trans is therefore $21,478,000.

It should be emphasized that office space at the garage is included only for operational staff. It was assumed that Wheel-Trans staff currently located at 1910 Yonge Street would remain at that location. This is based on the costs for construction of office space in conjunction with garage construction compared to continued rental of office space. The cost of an additional floor of office space at a central garage is estimated to cost $2.6 million (annualized cost of $349,440) plus appropriate plant maintenance costs compared to annual rental costs of $315,000 for an equivalent amount of space. As well, a second floor of office space at the Wheel-Trans garage (the same size as the first floor) would require construction of 15,000 sq. ft. of space. Since forecast space requirements to 1992 call for 7,000 sq. ft. of space, a second floor would be under-utilized for an undetermined period of time.

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(1) Refer to Appendix A for a description of the operating and space assumptions upon which the capital costs for the garage are based.

(2) The cost of radios and shop equipment is for a Wheel-Trans fleet of 250 vehicles.

(b) All-Way Capital Costs - If the current contract was extended, the TTC would require the contractor to bring the existing infrastructure up to a standard commonly accepted in the transit industry. As well, the contractor would require an additional facility to handle a doubling of the fleet size from 126 vehicles in 1987 to 246 vehicles in 1996.(1) The TTC, based on recent cost experience, conservatively estimates that the above facilities would require an expenditure of at least $12.5 million by the contractor in the 1987-96 time period. The assumption of $12.5 million in capital costs for the contractor is substantially less than what the TTC estimates it would actually cost a contractor to build acceptable facilities. On the assumption that a private company would not build a comparable facility to the TTC and/or would utilize cheaper construction methods, $12.5 million was assumed rather than the TTC's own estimate of contractor capital expenditures of approximately $20 million.

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(1) It is assumed that the existing contractor does not have sufficient capacity to meet vehicle growth projected for Wheel-Trans beyond the next several years.

5.2.5 Comparison of Annualized Costs

Capital costs can be annualized and added to annual operating costs using a net annualized cost analysis. This methodology takes into account the effects of inflation on purchasing power and the different times at which expenditures can be made.

Basically, the approach taken was as follows:

1. Capital and operating expenditures related to each option were identified by year in constant dollar terms (1987 $) over the relevant period from 1987 to 1996).
2. The stream of cash flows was then adjusted to reflect the projected inflation rate (5 percent).
3. The inflated stream was then discounted by the cost of capital (10 percent) and summed to obtain the net present value.
4. The net present value figure was then annualized over the specified time period (10 years).

An important issue in the calculation of annualized cost is the timing and depreciation of capital costs in a manner which is consistent and fair to two organizations with different financial and accounting philosophies. For example, normal practice for the TTC would involve depreciation of a capital expenditure such as a garage over the life of the facility (e.g. 40 years). This is based on the assumption that the TTC will still be in the transit business in the future and need not fear the potential termination of its "contract" prior to the full value of the garage being depreciated. A contractor, however, would likely try to recover most or all of its capital investment over the life of the contract to minimize the financial risk once the contract ends. Alternatively, a contractor would try to recover an investment over a period of time consistent with private sector accounting practices (20 years).

Since all of the above approaches are correct, the following options were developed for the treatment of capital costs:

1. Assume "lump sum" capital expenditures for both the contractor and TTC garage facilities in the actual years in which the expenditures would occur. For the TTC and All-Way the capital costs identified previously ($21.5 and $12.5 million respectively) were assumed to be split evenly between 1988 and 1989.

2. Assume that the capital expenditures for the contractor and TTC garage facilities are depreciated over the life of the facility (40 years). In this scenario only the depreciation costs for the 1987-96 period are included, i.e. only 25% of the appropriate capital expenditures is depreciated in the comparison of in-house and contracted operation.

3. Assume that both the TTC and contractor capital expenditures are depreciated according to private sector accounting practices or over a 20 year period. In this scenario, only the depreciation costs for the 1987 - 1996 time period are included, i.e. approximately 50 percent of capital costs are included in the comparison of both TTC and contracted operation.

4. Assume that both the TTC and contractor capital expenditures are fully depreciated over the time period in question (1987-96). Under this option, it is assumed that both the TTC and All-Way would fully recover the principle cost component of their capital expenditures and that there would be no "salvage value" at the end of the period. In effect, this option assumes that the TTC and All-Way would each be given a 10-year "contract" for the operation of Wheel-Trans.

Exhibits 5-6, 5-7, 5-8 and 5-9 present the annualized cost of in-house and contracted operation of Wheel-Trans, taking into account the above options for the treatment of capital costs and the effect of narrowing the wage gap on the cost of contracted operation.(1)

As summarized in Exhibit 5-10, the annualized cost of TTC operation of Wheel-Trans for the 1987-96 period (constant 1987 dollars) varies from $26.4 million to $28.6 million per year depending on the treatment of capital costs.(2) The cost of contracted operation is almost equal to TTC costs when the wage gap is eliminated over a five year period. The remaining options for narrowing of the wage gap result in TTC operation of Wheel-Trans being anywhere from 1 to 6 percent more expensive than contracted operation.

Using the same estimates of future expenditures (including the cost of capital), costs can be derived for TTC versus contracted operation in specific future years. Exhibit 5-11 shows the difference in cost per trip in 1988, 1992 and 1996 based on the most favourable and least favourable scenarios for TTC costs vis-a-vis contracted operation. Under a favourable scenario for TTC costs, the cost per trip for TTC operation is higher than the contractor in 1988 by $1.55 per trip but by 1992 and 1996 TTC operation is less

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(1) For more detailed information concerning year-by-year cash flows and discounting and annualization at capital and operating costs refer to Appendix B, C, D and E.

(2) In comparing these costs to contracted operation it must be remembered that due to the assumption of TTC work rules, wages and benefits for the entire period, the TTC costs represent a worst case scenario. If the TTC can retain some of the work rules in the current agreement between All-Way and ATU - Local 113, the above annualized costs for TTC operation would be reduced accordingly.

Exhibit 5-6

COMPARISON OF IN-HOUSE AND CONTRACTED COSTS OF OPERATION (LUMP SUM CAPITAL EXPENDITURES)(1)

COST	TTC WHEEL-TRANS	ALL-WAY 1. ELIMINATION OF WAGE GAP IN 5 YEARS	ALL-WAY 2. ELIMINATION OF 80% OF WAGE GAP IN 5 YEARS (NO PARITY)	ALL-WAY 3. NO NARROWING OF WAGE GAP
OPERATING COST(2)	$240.4	$249.9	$247.8	$236.2
CAPITAL COST(3)	21.5	12.5	12.5	12.5
TOTAL COST(4)	261.9	262.4	260.3	248.7
DISCOUNTED COST(5)	212.4	210.4	208.9	200.1
ANNUALIZED COST(6)	28.6	28.3	28.1	26.9
PERCENTAGE CHANGE		(1.0)	(1.7)	(5.9)

FOOTNOTE:

(1) All figures are millions of 1987 dollars.

(2) Total operating costs for 1987-1996 period.

(3) Assumes lump sum capital expenditures in 1988-89 for contractor and TTC garage facilities.

(4) Capital costs plus operating costs (1987-1996).

(5) Assuming 5% inflation, 10% interest rates.

(6) Represents the annual cost of operation in constant 1987 dollars for the 1987-96 time period.

Exhibit 5-7

COMPARISON OF IN-HOUSE AND CONTRACTED COST OF OPERATION (DEPRECIATE GARAGE OVER NINE YEARS) (1)

COST	TTC WHEEL-TRANS	ALL-WAY 1. ELIMINATION OF WAGE GAP IN 5 YEARS	ALL-WAY 2. ELIMINATION OF 80% OF WAGE GAP IN 5 YEARS (NO PARITY)	ALL-WAY 3. NO NARROWING OF WAGE GAP
OPERATING COST(2)	$240.4	$249.8	$247.8	$236.2
CAPITAL COST(3)	21.5	12.5	12.5	12.5
TOTAL COST(4)	261.9	262.4	260.3	248.7
DISCOUNTED COST(5)	209.7	208.7	207.2	198.4
ANNUALIZED COST(6)	28.2	28.1	27.8	26.7
PERCENTAGE CHANGE		(0.4)	(1.41)	(5.3)

FOOTNOTE:

(1) All figures are millions of 1987 dollars.

(2) Total operating costs for 1987-1996 period.

(3) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over life of assumed contract (nine years)

(4) Capital costs plus operating costs (1987-1996).

(5) Assuming 5% inflation, 10% interest rates.

(6) Represents the annual cost of operation in constant 1987 dollars for the 1987-96 time period.

Exhibit 5-8

COMPARISON OF IN-HOUSE AND CONTRACTED COST OF OPERATION (DEPRECIATE GARAGE OVER FORTY YEARS)(1)

COST	TTC WHEEL-TRANS	ALL-WAY		
		1. ELIMINATION OF WAGE GAP IN 5 YEARS	2. ELIMINATION OF 80% OF WAGE GAP IN 5 YEARS (NO PARITY)	3. NO NARROWING OF WAGE GAP
OPERATING COST(2)	$240.4	$249.9	$247.8	$236.2
CAPITAL COST(3)	4.8	2.8	2.8	2.8
TOTAL COST(4)	245.3	252.7	250.6	239.1
DISCOUNTED COST(5)	196.4	200.9	199.5	190.7
ANNUALIZED COST(6)	26.4	27.0	26.8	25.6
PERCENTAGE CHANGE		2.2	1.5	(3.0)

FOOTNOTE:

(1) All figures are millions of 1987 dollars.

(2) Total operating costs for 1987-1996 period.

(3) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over life of asset (forty years)

(4) Capital costs plus operating costs (1987-1996).

(5) Assuming 5% inflation, 10% interest rates.

(6) Represents the annual cost of operation in constant 1987 dollars for the 1987-96 time period.

Exhibit 5-9

COMPARISON OF IN-HOUSE AND CONTRACTED COST OF OPERATION (DEPRECIATE GARAGE OVER TWENTY YEARS)[1]

COST	TTC WHEEL-TRANS	ALL-WAY 1. ELIMINATION OF WAGE GAP IN 5 YEARS	ALL-WAY 2. ELIMINATION OF 80% OF WAGE GAP IN 5 YEARS (NO PARITY)	ALL-WAY 3. NO NARROWING OF WAGE GAP
OPERATING COST[2]	$240.4	$249.9	$247.8	$236.2
CAPITAL COST[3]	9.7	5.6	5.6	5.6
TOTAL COST[4]	250.1	255.5	253.4	241.9
DISCOUNTED COST[5]	200.3	203.2	201.7	192.9
ANNUALIZED COST[6]	26.9	27.3	27.1	25.9
PERCENTAGE CHANGE		1.5	0.7	(3.7)

FOOTNOTE:

(1) All figures are millions of 1987 dollars.

(2) Total operating costs for 1987-1996 period.

(3) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over a period of time consistent with private sector accounting practices (20 years).

(4) Capital costs plus operating costs (1987-1996).

(5) Assuming 5% inflation, 10% interest rates.

(6) Represents the annual cost of operation in constant 1987 dollars for the 1987-96 time period.

Exhibit 5-10

COMPARISON OF IN-HOUSE AND CONTRACTED COSTS OF OPERATION (1987-96)(1)

CAPITAL COST ASSUMPTION	TTC	CONTRACTOR		
		ELIMINATION OF WAGE GAP IN FIVE YEARS	ELIMINATION OF 80% OF WAGE GAP IN 5 YEARS (NO PARITY)	NO NARROWING OF WAGE GAP
1. LUMP SUM EXPENDITURE FOR GARAGE IN 1988-89	$28.6	$28.3	$28.1	$26.9
2. DEPRECIATE GARAGE OVER 40 YEARS	$26.4	$27.0	$26.8	$25.6
3. DEPRECIATE OVER 20 YEARS	$26.9	$27.3	$27.1	$25.9
4. DEPRECIATE OVER 9 YEARS	$28.2	$28.1	$27.8	$26.7

FOOTNOTE:

(1) All figures represent the annualized cost (capital and operating) of Wheel-Trans service (millions of 1987 dollars) for the 1987-1996 period.

Exhibit 5-11

COMPARISON OF COST PER TRIP FOR TTC AND CONTRACTED OPERATION IN SELECTED YEARS

	TTC OPERATION		CONTRACTOR		NET
Year	Total Cost (1)	Cost Per Trip	Total Cost (1)	Cost Per Trip	DIFFERENCE PER TRIP
Favourable Scenario (2)					
1988	$19,625,600	$28.29	$18,546,000	$26.74	$ -1.55
1992	25,253,800	26.21	26,671,400	27.68	+1.47
1996	30,444,000	25.43	33,127,600	27.68	+2.25
Pessimistic Scenario (3)					
1988	21,475,000	30.96	19,355,900	27.90	-3.06
1992	27,103,200	28.13	25,897,000	26.88	-1.25
1996	32,289,400	26.98	31,904,500	26.65	-0.33

FOOTNOTES:

(1) All figures are total costs for a given year in millions of 1987 dollars (undiscounted, no annualization).

(2) Favourable scenario assumes that TTC and contractor garage facilities will be depreciated over 40 years and the wage gap between the TTC and the contractor is eliminated in five years.

(3) Pessimistic scenario assumes that TTC and contractor garage facilities will be depreciated over the life of the contract (9 years) and that there will be no narrowing of the wage gap between the TTC and the contractor.

expensive by $1.47 and $2.25 per trip respectively. Under a scenario which is favourable to the contractor, the cost of TTC operation is higher in all three years ranging from $0.33 to $3.06 per trip.

5.2.6 Analysis of Cost Differences

The above analysis demonstrates that it is not the capital cost of garage facilities which determines the cost savings of contracting out but the operating costs and specifically the impact of the narrowing of the wage gap. Comparing the annual cost of TTC operation of $26.4 to $28.6 million to the cost of contracting out ($25.6 to $26.9 million) results in a maximum savings in annual costs of between 1 and 6 percent over a ten year period. Assuming elimination of the wage gap between TTC and All-Way employees within 5 years, TTC operation of Wheel-Trans is almost identical to the cost of contracted operation regardless of how capital costs are handled.

Given the marginal annual cost differences between contracted and in-house operation of Wheel-Trans it would appear full integration of the service by the TTC would be cost-effective in the long-term. In addition, there are quantitative and qualitative benefits to the full integration of Wheel-Trans by the TTC which are discussed in the following chapter.

6.0 BENEFITS OF FULL INTEGRATION OF WHEEL-TRANS

6.1 Introduction

As outlined in Chapter 5, full integration of Wheel-Trans by the TTC, including the provision of necessary maintenance facilities is cost-effective even under a worst case scenario for TTC operating costs. The purpose of this chapter is to outline the benefits of full integration in comparison to the marginal differences in cost identified in Chapter 5. It should be emphasized that in a true cost/ benefit analysis, all benefits (tangible and intangible) are assigned a financial value. In this analysis, no financial value is assigned to the benefits and there is no "bottom line" comparison of cost/benefit. The recommendation concerning whether the benefits outweigh the marginal cost differences is a judgement based on what is best for all parties, most importantly, the disabled community.

6.2 Benefits of Full Integration

The benefits of the TTC assuming full responsibility for Wheel-Trans include the following:

- improved quality of service;
- improved customer satisfaction;
- protection of TTC assets (Orion II vehicles) through improved maintenance practices;
- better driver training;
- increased passenger safety;
- improved accountability;
- increased management autonomy and control; and

- improved continuity of service.

In discussing the above benefits of full integration, it is acknowledged that some of the above benefits could be realized without direct operation of Wheel-Trans by the TTC (i.e. through continued contracting out of Wheel-Trans). The TTC believes, however, that a contracted operation will always be of lower quality, regardless of how stringent the contract.

As noted in Chapter 5, if the TTC were to continue to contract out Wheel-Trans to a private company, major changes in the existing contract would be required. When the existing contract was written, the contractor supplied all vehicles and no contract provisions or financial penalties were included to require the contractor to maintain vehicles to specific standards or meet TTC operational requirements. Since the TTC is now supplying vehicles to a contractor the issue of maintenance and operational standards is of major concern if the contract is extended.

6.3 Qualitative Benefits

6.3.1 Quality of Service

The TTC has a world-wide reputation for innovation, excellence and its standards of quality. The TTC's commitment to providing the highest quality of service is evident by the TTC motto of "safety, comfort and courtesy". It is also evident in the TTC's 10,000 employees who demonstrate on a daily basis the Commission's dedication to its riders. The TTC expects that by assuming full responsibility for Wheel-Trans, a gradual yet noticeable improvement in the quality of service offered Wheel-Trans users can be achieved. Through the centralization of garage facilities, improved supervision of operators and mechanics and implementation of TTC policies and procedures the operation and maintenance of Wheel-Trans will improve. Wheel-Trans customers tell us there is room for improvement.

It is reasonable to assume, however, that with more stringent language and financial penalties, future contracts could result in an improvement in the quality of service provided by a contractor. Noticeable improvements in the quality of service provided by a contractor would involve a substantial commitment of additional funds (capital and operating) thereby reducing the cost advantage of contracting out. The TTC believes that it can provide a superior quality of service to the private sector given the TTC's enviable record as one of the best transit systems in North America.

6.3.2 Customer Satisfaction

With improved quality of service improved customer satisfaction will follow. As mentioned previously, the disabled community has felt for some time that contracting out of Wheel-Trans represents discrimination and is unacceptable. Complaints by riders in regards to vehicle operation and maintenance continue to be a source of concern especially when over 60 percent of registered complaints are directly related to the contract operation. Just as complaints dropped dramatically when the TTC assumed responsibility for reservation, scheduling and dispatching, a similar drop in complaints is expected if the TTC assumes responsibility for daily operations and maintenance. It should be noted, however, that the takeover of Wheel-Trans by the TTC will not be an immediate panacea to the operational and maintenance problems currently being experienced. It will take time before the effect of TTC management on customer satisfaction will be fully realized.

Since quality of service is directly related to customer satisfaction, it is difficult to see how continued contracting out will overcome current rider perceptions.

Despite improvements in the quality of service in recent years, Wheel-Trans riders continue to express the belief that the TTC can do a better job of meeting their needs than a private contractor.

6.3.3. Maintenance of Vehicles

Outdoor storage of vehicles, extensive sub-contracting by the contractor, lack of proper maintenance equipment, (e.g. use of jacks rather hoists), questionable preventative maintenance capability, high employee turnover and limited staff training are all factors which affect the contractors ability to properly maintain TTC-owned vehicles. As many U.S. transit systems learned the hard way, neglect of maintenance can have dramatic long-term consequences on the cost, reliability and attractiveness of transit services. The construction of a central garage with proper equipment, effective manpower supervision, reasonable staffing levels, a commitment to preventative maintenance and improved inspection and servicing of vehicles should yield the following benefits:

- extended engine and major component life:
- reduced vehicle breakdowns and road calls;
- reduced body corrosion (due to indoor storage);
- improved cleanliness of interior and exterior of vehicles; and
- increased operating efficiency and provision of some additional rides.

The ability of private companies to maintain TTC-owned vehicles even with rigorous enforcement of contract provisions is difficult to ascertain. Current maintenance practices are far below TTC standards and as noted in Chapter 5 the contractor would be required to substantially improve maintenance facilities if the contract was renewed. From the TTC's perspective, maintenance of TTC vehicles by a contractor will always represent a risk.

6.3.4 Safety

The TTC is the safest transit system in North American, having won the American Public Transit Association's Silver Shield for passenger safety 17 of the last 20 years. It is interesting to note that in 1986 the Wheel-Trans "incident/accident rate per 100,000 miles" was 7.8 compared to 2.98 for the conventional transit system. TTC resources to improve the safety record of Wheel-Trans includes a Department devoted solely to safety as well as specialized training for drivers and maintenance personnel. Since safety involves a management and union commitment over an extended period of time, it is possible for private sector companies to achieve comparable safety records to public organizations. However, improvements in safety require a philosophical commitment which cannot be enforced or regulated through a contractual arrangement. As well, an organization's safety record is representative of the collective will of an organization's employees and is not easily "transferred" from organization to organization.

6.3.5 Training

As drivers continue to be a major source of complaints, improved driver training is obviously required. Training of drivers in such areas as sensitivity awareness, passenger handling and defensive driving is directly related to customer satisfaction and on-the-road safety. The TTC, in recognition of the value of a courteous and safe driver, would make a major commitment to driver training. The training program for new drivers, through the TTC's Operations Training Centre, includes over four weeks of classroom and in-vehicle training compared to one week of training provided by the contractor. Improvements in driver training are especially important for Wheel-Trans to prevent falls or accidents. The driver of a Wheel-Trans vehicle has considerably more responsibility for the safety of individual users and therefore it is imperative that they be properly trained.

Similarly, the TTC through its industrial safety and apprenticeship programs can substantially improve the training and productivity of maintenance personnel. Improved training of maintenance staff will hopefully lead to better quality service on a daily basis. It would be possible, however, for the TTC training program to be adopted by a private sector company and/or for the TTC to provide driver training and this requirement could be included in future contracts. However, training and staff development involves continued evaluation and assessment of employees and on-going re-training of staff. Consequently, a requirement that a contractor provide the equivalent of TTC training will not solve all of the identified problems with operational staff.

6.3.6 Management Control

With the TTC assuming responsibility for operations and vehicle maintenance, TTC management will be able to exercise full control over the Wheel-Trans service. Currently the separation of functions and certain contract provisions limit management's ability to improve performance and implement changes. While the contractor would argue that it can implement changes more quickly and that a proper contract is the appropriate means to exercise control, management's ability to effect changes will always be constrained with a contracted operation.

6.3.7 Continuity of Service

One of the major advantages of full integration of Wheel-Trans by the TTC is continuity of service. The possibility of a strike exists with both in-house and contracted operation. However, the ability of senior levels of government to legislate the employees of a private contractor back to work is more limited in comparison to employees of a public organization. The risk of service disruptions due to the sale or bankruptcy of a contractor or re-tendering of the contract would be eliminated with public operation of Wheel-

Trans. As most Wheel-Trans users are captive to the system and do not have alternative means of travel, service disruptions due to strikes or renewal of contracts represent extreme hardship for the disabled community.

6.3.8 Accountability

Currently, due to the multiple layers of responsibility, accountability to users concerning complaints, quality of service, etc. is blurred. As well, accountability of elected officials is obscured as day-to-day operations do not rest with the agency responsible for management of the system (i.e. the TTC). With the TTC assuming full responsibility for all phases of the operation, accountability to users and to Metro Council will be substantially improved. The issue of accountability cannot be regulated or enforced through contract provisions.

6.3.9 Summary of Qualitative Benefits

The benefits of the TTC assuming full responsibility for Wheel-Trans include improved quality of service and maintenance of vehicles, increased customer satisfaction, better driver training, improvements in passenger safety, increased management control and less risk of service disruptions to users. While some of the above benefits could be addressed in some fashion by improved contract language, contracting out would not completely solve the fundamental problems currently facing Wheel-Trans users and TTC management.

6.4 Quantitative Benefits

The major tangible benefit of full integration of Wheel-Trans by the TTC is reduced vehicle expenditures by Metro and the Province due to achievement of a 12 - 15 year life for the Orion II fleet.

To ensure that the Orion II fleet reaches its expected life of 12-15 years, a substantial on-going commitment to maintenance is needed. If maintenance is unsatisfactory warranty claims to the manufacturer could be questioned and vehicles would require replacement before their useful life is reached. The effect of continued poor maintenance would be the need to replace the Orion II fleet earlier than anticipated. The cost of replacing the entire Wheel-Trans fleet required to meet 1996 service levels is $29.7 million (1987 dollars). The current investment in the Orion II fleet is $14.5 million alone.

Second, TTC operation of Wheel-Trans will substantially reduce insurance and accident costs relative to the performance of the contractor. The exact magnitude of the savings is not known due to difficulty in ascertaining the costs of the contractor in these areas. The cost of TTC operation reflects the lower TTC accident rate and related insurance costs.

6.5 Quality Versus Quantity of Service

Given the above, the key question is whether or not the expenditure of between 1 and 5 percent more per year for TTC operation of Wheel-Trans is reasonable to achieve the identified benefits. The TTC believes strongly that improvements in the service are necessary and that continued contracting out will only prolong the solution of the identified problems. As well, the current $14.5 million investment in the Orion II fleet must be protected.

The issue of whether or not the disabled community would prefer that the funds expended on the takeover be spent instead on increased levels of service is a valid one. However, by its continued insistence that the quality of service provided by the contractor is lower than that which could be provided by the TTC and its demand that the TTC assume full responsibility for Wheel-Trans, the disabled community has largely answered the question itself. The disabled community has stated quite clearly that it is entitled to the same quality of service as regular transit users and it recognizes that a modest premium for TTC operation is reasonable to bring the quality of service up to TTC standards. Increased levels of inferior quality service is simply not the preference of the disabled community.

The delivery of new vehicles in 1988 will allow for the provision of additional service to help reduce the non-accommodation rate. Currently, the Wheel-Trans non-accommodation rate varies on a month-to-month basis between 9 to 10 percent of overall demand. As in past years, Wheel-Trans is projecting a 1988 growth in the demand for specialized services of 10 percent.

By December 1987, Wheel-Trans will be operating a peak fleet of 108 vehicles. During 1988, it is planned to expand peak service by 20 percent or 22 vehicles to accommodate the anticipated growth in demand and reduce the rejected bookings substantially below their current level. The 1988 Orion II bus order recently approved by Metropolitan Council, includes 14 of the 22 required expansion vehicles. An additional 8 peak service vehicles are also included in the 1988 capital budget for specialized small vehicles. An expansion of the Wheel-Trans vehicle fleet to eliminate rejected bookings is planned for mid-1988, once the current aging Mighty-Mite bus fleet has been totally replaced.

6.6 Conclusion

In conclusion, due to the benefits that have been identified and to address the concerns of the disabled community, it is recommended that the TTC assume full responsibility for Wheel-Trans as soon as possible. Although it is recognized that this will increase annual costs by between 1 and 6 percent over the 1987-1996 period substantial benefits will be realized including protection of TTC-owned vehicles and improved quality of service. The following chapter provides details concerning alternative garage requirements while Chapter 8 outlines other implementation and timing issues.

7.0 ALTERNATIVES FOR PROVISION OF MAINTENANCE AND RADIO FACILITIES

7.1 Introduction

As outlined in Chapter 5, the costing analysis for in-house operation has assumed the construction of a new Wheel-Trans garage. The size, configuration and location; indeed, the justification for a garage facility has been analyzed and is the subject of this chapter. As well, the alternatives for the provision of a radio system for Wheel-Trans vehicles is also considered.

7.2 Alternatives for Provision of Maintenance Facilities

7.2.1 Introduction

Four alternatives have been identified for the provision of maintenance facilities for Wheel-Trans:

(1) Acquisition and renovation of an existing All-Way garage facility;

(2) Distribution of Wheel-Trans vehicles among existing TTC garages;

(3) Construction of a new central garage; and

(4) Acquisition and renovation of an existing garage (other than All-Way).

The above four options represent alternatives to the construction of a new garage as defined by the Environmental Assessment Act (i.e. alternatives to the undertaking). Obviously, there are numerous alternative means of constructing a garage (e.g. a single facility, a number of small facilities, phased construction, a maintenance facility with outdoor storage of vehicles). The alternative ways of constructing a garage are considered separately in Section 7.3.

Following preliminary screening of the above four options, Option 1 was eliminated and consequently is not considered in the following financial and operational analysis. The reasons for screening out Option 1 are as follows:

- the current facilities of the contractor are significantly below TTC standards for garages as shown in Exhibit 7-1. Substantial modifications would be required to bring All-Way's facilities up to standard and would likely approximate the cost of a new garage;

- renovation of the contractor's facilities while still maintaining Wheel-Trans service satisfactorily would be extremely difficult if not impossible; and

- The contractor has informed the TTC that its facilities are not available in the event the current contract is not renewed.

The remaining three alternatives are analyzed from a financial and operating point of view in the following section.

7.2.2 Analysis of Alternatives

(a) Financial Analysis

In analyzing the financial performance of the above three options, the same method utilized in Chapter 5 was employed.

Exhibit 7-1

COMPARISON OF TTC AND CONTRACTOR GARAGE FACILITIES

		All-Way Transportation		
Area	Equipment	Gurney Property	Crockford Property	TTC Facility
Repair Inspections	Hoists	No - Use Floor Jacks	No - Use Floor Jacks	Yes
	Pits	No	No	Yes
	Shop Air Supply	Yes	Yes	Yes
	Shop Drill Press	Yes	Yes	Yes
	Hydraulic Press	No	No	Yes
	Engine Oil Dispenser	Manual	Manual	Pneumatic Operated
	Transmission Oil Dispenser	Manual	Manual	Pneumatic Operated
	Grease Dispenser	Manual	Manual	Pneumatic Operated
	Spare Battery Storage	No	No	Yes
	Battery Charger	Yes	Yes	Yes
Paint Shop	Capability of Completing Paint Touch-ups	No	No	Yes
	Spray Booth	No	No	Yes
	Designated Area	No	No	Yes
Body Shop	Proper Repair Equipment	No	No	Yes
	Welding Equipment - Gas	Yes	Yes	Yes
	Welding Equipment - Electric	Yes	Yes	Yes
	Designated Area	No	No	Yes
Degreasing Area	High Pressure Wash Equipment	No	Yes	Yes
	Drainage in Accordance to Ministry of Environment	-	Unknown	Yes
	Designated Area	-	Yes	Yes
Parts Storage		Yes	Yes	Yes
Tire Area	Tire Storage Area	Yes	Yes	Yes
	Tire Regrooving	No	No	Yes

Exhibit 7-1

(Continued)

Area	Equipment	All-Way Transportation		
		Gurney Property	Crockford Property	TTC Facility
Service Line	Exterior Bus Washing	No	No	Yes
	Interior Bus Cleaning	No	No	Yes
	Fuel Dispenser Equipment	Gas & Diesel	Diesel Filled at Local Gas Station	Yes
	Lubrication Top-Up	Manual	Manual	Pneumatic Operated
	Anti-Freeze Top-Up	Manual	Manual	Pneumatic Operated
Inside Vehicle Storage		No	No	Yes
Parts Truck		No	No	Yes
Emergency/Tow Truck		-- One Shared Unit --		Yes

The following assumptions were made for all three options:

- steady growth in Wheel-Trans operating costs from 1988 to a "mature" fleet of Wheel-Trans vehicles in 1996. Following 1996, no change in operating costs was assumed;
- capital costs expended in the 1988-93 time period (depending on the option);
- all operating and capital costs to the year 2012 are included (25 years);
- all costs annualized over 25 years; and
- The impact of alternative garage scenarios on vehicle maintenance, plant maintenance, dispatching, computer facilities, radio equipment, travel time allowances and deadhead mileage has been taken into account.

As shown in Exhibit 7-2 and Appendix F, Option 3, the construction of a single central garage is the cheapest alternative when compared to Option 2 - Distribution of Wheel-Trans Vehicles Among Existing TTC Garages and Option 4 - Renovation of an Existing Facility. The annualized cost of a central facility represents a 14.7 percent savings compared to Option 2 and a 0.5 percent savings compared to Option 4. The major differences in capital and operating costs between the three options are outlined in the following pages.

In terms of operating costs, it was assumed that annual operating costs would be identical for Options 3 and 4. It was not possible to account for differences in deadhead mileage or travel time allowances between the Midland Avenue and Allen Road sites. As the Midland Road site is not as centrally located as Allen Road and Sheppard Avenue, some additional deadhead mileage could be expected with Option 4.

Exhibit 7-2

NET PRESENT VALUE COST ANALYSIS OF GARAGE OPTIONS

Cost Item	OPTION 2 - Distribution of Wheel-Trans Vehicles Among Existing TTC Garages (2)	OPTION 3 - Central Garage (1)	OPTION 4 - Renovate Existing Facility Other Than All-Way (3)
CAPITAL COSTS			
Modifications	$9,000,000	-	-
Construction	20,250,000	$18,300,000	$14,345,000
Property	1,649,000	1,649,000	7,500,000
Equipment	1,814,800	969,000	1,013,000
Radio	595,000	560,000	560,000
Computer	200,000	-	-
Sub-Total	33,508,800	21,478,000	23,418,000
OPERATING COSTS			
1988	19,088,600	19,088,600	19,088,600
1996	34,681,500	29,903,000	29,903,000
1988-2012	798,954,800	700,862,000	700,862,000
TOTAL COST (1988-2012)(4)	832,463,500	722,340,000	724,280,000
DISCOUNTED COST (1988-2012)	471,573,900	411,306,700	413,302,800
ANNUALIZED COST	$ 33,623,200	$ 29,326,200	$ 29,468,500

FOOTNOTES

(1) Construction and property costs are based on using Allen Road lands.

(2) Malvern, Birchmount, Queensway, Wilson and Arrow Road.

(3) A potential site at Midland Avenue and MidWest Road was identified.

(4) Capital costs plus operating costs (1988-2012).

The annual operating costs for Option 2 are substantially higher than the other two options for two major reasons. First, unlike the regular fixed route transit service which allocates the number of vehicles to a fixed route on a regular basis, the Wheel-Trans service prepares a different schedule and route for each vehicle daily. Also, because the Wheel-Trans vehicles cover the whole of Metropolitan Toronto, the last drop-off on a drivers shift and his first pick-up will not usually be in the same area. This makes the issue of centralized vs. decentralized garages different from that of the conventional transit service which has known start and end locations of its routes. A typical distribution of locations for the starts and ends of the Wheel-Trans runs and their "spatial" relationship is shown in Exhibit 7-3. As well, the location of a driver's first pick-up is not finalized until the last moment when the driver boards his/her vehicle and receives from the Dispatcher the last minute cancellations and demand response requests for service. Similarly, the location of the end of a driver's run is not finalized until the last cancellations and demand response requests have been completed and the driver is cleared to return to the garage. Also, as Wheel-Trans continues to shorten the call-in period, the service will be increasing the proportion of same day requests. This will make flexibility a more critical criteria and require that a vehicle be put into service to any point in the city as efficiently as possible.

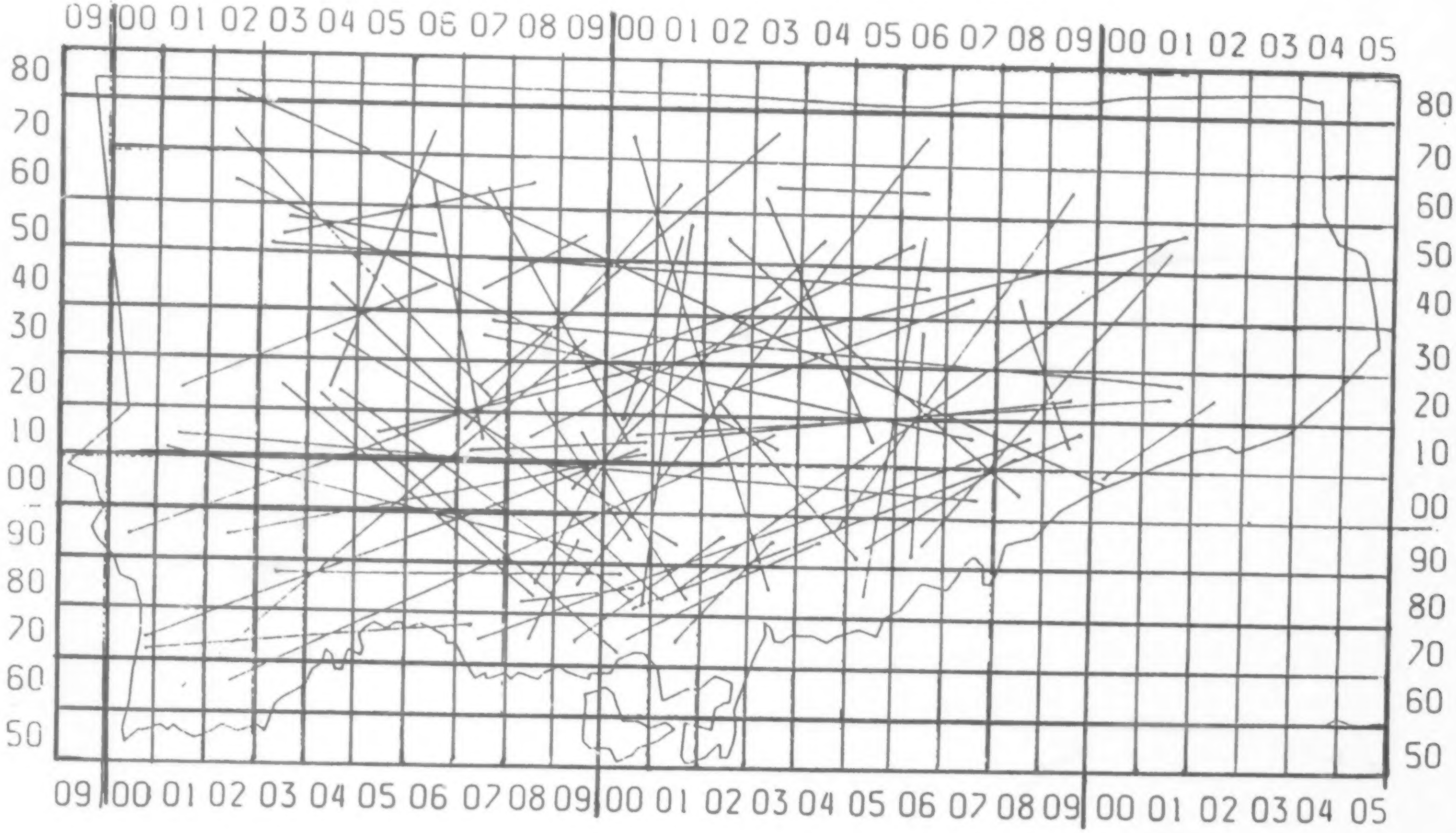
As a result of the above, it is anticipated that the optimal garage location strategy to minimize travel times is to locate a single garage centrally such that it conveniently serves all points within Metropolitan Toronto. In addition, since Wheel-Trans trips are concentrated in Central Metro, a single centrally located garage provides the shortest access to the greatest number of requested trip-ends. Consequently, Option 2, in which Wheel-Trans buses are

Exhibit 7-3

Typical Spatial Distribution of Wheel-Trans Trips

METROPOLITAN TORONTO

LINE JOINS THE START AND END LOCATIONS OF WHEEL-TRANS RUNS


09 00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05
80 70 60 50 40 30 20 10 00 90 80 70 60 50

decentralized to five existing TTC garages would increase travel time allowances paid to drivers and deadhead mileage relative to Options 3 and 4 (which involve a single garage). Second, Option 2 increases maintenance and operating costs due to the duplication of staff (including dispatching personnel at all five locations) and affects the number of spare drivers required.

In terms of capital costs, Option 2 would require modifications to the five existing TTC garages to provide for a separate servicing line (bus washing, fueling, cleaning and service line check) as existing TTC equipment is designed for 40 ft. buses. The estimated capital cost per facility for these modifications is $1.8 million. Location of Wheel-Trans vehicles at existing TTC facilities would displace existing regular TTC vehicles, therefore a garage facility for the displaced regular vehicles would also be required.(1) It has been assumed that 75 percent of the cost of a new garage for regular TTC vehicles could be attributed to the displacement of vehicles by Wheel-Trans. In addition, higher costs for computer facilities and radio equipment are estimated due to the need to duplicate "base" equipment of all five garage locations.

In summary, from a financial perspective, Option 2 is not cost-effective while there is little difference in cost between Options 3 and 4. Due to the availability of land at Allen Road, it would appear to be an unnecessary duplication for Metropolitan Toronto to purchase additional land for a Wheel-Trans facility (Option 4). As well, the Allen Road property is centrally located within Metro and has excellent arterial road and highway access (Highway 400 and 401) to all parts of Metro Toronto. Clearly, since Option 3 is the cheapest alternative and represents a use of land already owned by Metro for TTC use, it must be the preferred option from a financial perspective.

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(1) It is estimated that with accommodation of 173 Wheel-Trans vehicles, maximum garage capacities would be reached by 1991 even with Arrow Road. At the projected rate of expansion of the regular TTC fleet, in terms of optimal garage capacity and assuming no displacement of TTC vehicles, the TTC will require an additional maintenance facility by 1989.

(b) Operational Perspective

From an operational perspective, Option 2, in which Wheel-Trans vehicles are dispersed to five existing TTC garages is not recommended for the following reasons:

- the mixing of Wheel-Trans and regular TTC vehicles is problematic. Even with separate servicing lines, due to different dispatching systems, a completely segregated parking area for both types of vehicles is required;

- Depending on the mix of Wheel-Trans and regular vehicles, with separate storage, the storage capacity of garages could be under-utilized;

- the feasibility of modifying existing locations to accept Wheel-Trans vehicles has not been determined. Modifications include separate servicing line, segregated parking, changes to hoists, installation of dispatching and computer equipment and fuel tanks. It is anticipated that at several locations such modifications may be impractical or impossible;

- displacement of regular TTC vehicles and the resultant congestion at all garages until an additional garage can be constructed will adversely affect the quality and reliability of regular TTC operations; and

- displacement of regular TTC vehicles leaves no flexibility in garage capacity to accommodate anticipated fleet mix changes. For example, the need for an additional garage does not include such items as purchase of 60 additional trolley coaches nor the possible conversion of Lansdowne Garage to an all trolley facility, which would displace even more diesel buses to other city locations. As well, should Wheel-Trans vehicles be moved to existing TTC facilities, it could have a major impact on the feasibility of converting TTC garages to accept articulated buses and their unique maintenance and servicing requirements.

Clearly, Option 2 has significant disadvantages from an operational perspective and cannot be recommended.

In comparing Options 3 and 4, Option 3 would be preferred from an operational perspective. The construction of a new facility (Option 3) specifically designed for Wheel-Trans is preferable to sacrificing certain operational features due to the physical parameters of the Midland Avenue site (Option 4) and/or prohibitive rehabilitation costs to incorporate such features. The Midland Avenue site is not desirable from an operational point-of-view and could seriously hinder future Wheel-Trans operations.

7.2.3 Summary

From both a financial and operational perspective, Option 3, the construction of a new central garage is the preferred alternative. The following section examines a number of different ways of constructing a Wheel-Trans storage and maintenance facility.

7.3 Alternative Means of Construction a Wheel-Trans Maintenance Facility

7.3.1 Introduction

Based on the conclusion that construction of a new garage is preferred, a number of alternative means of constructing a Wheel-Trans maintenance and storage facility have been identified as noted below:

Option A - Construction of a maintenance facility with permanent outdoor storage of vehicles.

Option B - Phased construction of a maintenance facility with temporary storage initially. Covered indoor storage to be constructed as a second phase five years following construction of the initial maintenance facility.

Option C - Construction of three small garages for Wheel-Trans vehicles.

Option C was included despite the operational and financial disadvantages of multiple garage locations identified previously. It was felt that Option 2, the distribution of TTC vehicles at five existing TTC locations (see Section 7.2) was a worst case scenario due to the assumption of modification costs to existing facilities plus the construction of a new facility for the vehicles displaced by Wheel-Trans. Option C, due to the construction of new facilities only and the assumption of three facilities (rather than five) should represent a fairer comparison of multiple garage construction and operation.

Options A, B and C were subject to the same financial analysis as outlined in Section 7.2 and are compared to Option 3, the construction of a centralized maintenance facility (with covered storage) to determine if Option 3 is still the preferred alternative.

7.3.2 Financial Analysis

As shown in Exhibit 7-4 and Appendix G, Option 3 - the construction of a single garage with indoor storage is still the most financially attractive option. Option 3 represents a 1.6 percent, 0.7 percent and 10.9 percent savings on an annualized cost basis compared to Options A, B and C respectively. The capital and operating cost differences between the four options are discussed below.(1)

In terms of capital costs, Option A, which involves permanent outdoor storage of vehicles, is by far the cheapest alternative representing a substantial savings compared to all options. For the same reasons outlined in Section 7.2, construction of three smaller garages (Option C) involves higher capital costs due to the need for redundant facilities and equipment at all three locations. Phased construction of a garage facility with outdoor storage constructed five years after the initial maintenance garage is completed (Option B) has a higher capital cost than Option 3 due to higher engineering and design costs. These higher costs are partially offset by the fact that the expenditure for the second phase of the garage (indoor storage) is five years into the future and is therefore more heavily discounted for inflation when calculating net present value.

In terms of operating costs, Option 3 is the lowest cost alternative. Option C (three garages) is not cost effective due to higher costs for plant maintenance, travel time allowances, deadhead mileage, and duplication of maintenance staff and spare parts compared to a single garage scenario. Options A and B have higher operating costs than

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(1) The option of building a 200-vehicle garage initially, and expanding to 250 vehicles later was examined but rejected because the $1 million capital cost saving was outweighed by the disruption caused by having to expand the facility while the garage is in full operation.

Exhibit 7-4

NET PRESENT VALUE COST ANALYSIS OF CONSTRUCTION OPTIONS FOR A WHEEL-TRANS GARAGE

Cost Item	OPTION 3 - Central Maintenance Facility - Indoor Storage (1)	OPTION A - Central Maintenance Facility - Permanent Outdoor Storage	OPTION B - Central Maintenance Facility - Phased Construction of Indoor Storage	OPTION C - Construction of 3 Small Garages - Indoor Storage
CAPITAL COSTS				
Construction	$18,300,000	$13,300,000	$19,100,000(2)	$22,000,000
Property	1,649,000	1,649,000	1,649,000	2,664,000
Equipment	969,000	1,013,000	1,013,000	2,491,000
Radio	560,000	560,000	560,000	580,000
Computer	-	-	-	100,000
Sub-Total	21,478,000	16,522,000	22,322,000	27,835,000
OPERATING COSTS				
1988	19,088,600	19,088,600	19,088,600	19,088,600
1993	26,119,600	26,897,800	26,897,800	28,465,100
1996	29,903,000	30,794,700	29,903,000	33,619,900
1988-2012	700,862,000	721,184,400	704,356,400	777,164,600
TOTAL COST (1988-2012)(4)	722,340,000	737,706,400	726,678,400	804,999,600
DISCOUNTED COST (1988-2012)	411,306,700	417,993,387	414,149,600	456,197,200
ANNUALIZED COST	$ 29,326,200	$ 29,802,900	$ 29,528,900	$32,526,900

FOOTNOTES

(1) From Exhibit 7-2.

(2) $13,300,000 for Phase I, $5,800,000 for Phase II.

(3) Assumes a 3% operating cost premium for outdoor storage of vehicles from 1988-2012.

(4) Assumes a 3% operating cost premium for outdoor storage of vehicles from 1988-1993.

(5) Capital costs plus operating costs (1988-2012).

Option 3 due to the assumption of a 3 percent premium on operating costs for the period of time that vehicles are stored outside. For Option A, the premium applies to the entire 1988-2012 time period while for Option B the premium is included only for the 1988-1993 time period. The operating cost savings of indoor storage of vehicles are well-known in the transit industry. According to a report prepared by Delcan which analyzed the experiences of six U.S. and Canadian transit systems indoor storage of vehicles is not only cost-effective but can produce real savings over the life of garage.(1) According to the report, for a 30 bus fleet:

> "by virtue of indoor storage, annual operating maintenance and servicing costs can be reduced by $88,949 per year. Taking this into account, the storage building can show a net annual saving of $70,540. For an initial cost of $631,817 for a storage area only, realizing a Provincial subsidy of 75 percent, an initial outlay of $157,954 by the transit property could reduce annual costs to the transit property by $35,270 annually."(2)

In other words, it would take only 4.5 years to pay back the local cost of building indoor storage or 17.9 years to pay back the entire cost of indoor storage. Since garages typically last 40-50 years, the choice of indoor storage from a financial perspective is obvious. For the above reason and the operating advantages outlined in Section 7.3.3, the Ontario Ministry of Transportation and Communications encourages the indoor storage of vehicles.(3)

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(1) Chaput, Hector. An Analysis of Indoor versus Outdoor Storage, Delcan, 1975.

(2) All figures adjusted to 1987 dollars.

(3) Ontario Ministry of Transportation and Communications (MTC), Guidelines for the Design of Urban Transit Bus Garages, MTC, Transit Office, November, 1978.

In summary, the preceeding financial analysis confirms that Option 3, the construction of a single central maintenance facility with indoor storage, is the preferred alternative.

7.3.3 Operational Perspective

From an operational perspective, Option C has the same disadvantages as outlined in Section 7.2 while Options A and B would create significant operational problems due to the assumption of outdoor storage of vehicles for various lengths of time. As shown in Exhibits 7-5 and 7-6, indoor storage of vehicles is standard practice in Toronto and many other Ontario municipalities. The operational advantages of indoor storage (as assumed for Option 3 and Option C) are described below.

The advantages of indoor storage of vehicles include improved vehicle reliability, longer vehicle life, improved rider comfort and reduced environmental disruption and pollution.

(a) Vehicle Reliability

In terms of the regular transit system, reliability of service is an important but often overlooked factor in an individual's decision to use transit services. Schedule reliability becomes particularly important where headways are large and is severely affected when vehicle maintenance has failed to the point where not enough vehicles are available to meet service demands. In other words, decisions regarding maintenance affect the reliability of the service, which affects ridership, and ridership in turn affects overall system performance.

The effect of vehicle reliability on system performance and ridership is more pronounced for a system such as Wheel-Trans in comparison to the conventional fixed-route

Exhibit 7-5

CURRENT STORAGE OF TTC BUS AND TROLLEY COACH FLEET

	Present Allocated Vehicle	Maximum Garage Operating Capacity	Present Distribution of Vehicles	
			Inside Storage	Outside Storage
MALVERN	250	250	250	0
DANFORTH(1)	141	150	141	0
BIRCHMOUNT	251	260	90	161
EGLINTON				
- Motor Buses	155	197	155	0
- Trolley Coaches	25		25	
DAVENPORT	147	157	40	107
LANSDOWNE				
- Motor Buses	98	220	60	163
- Trolley Coaches	125			
QUEENSWAY	184	210	150	34
WILSON	307	300	300	7
TOTAL	1,683	1,744	1,211	472

Percentage of Indoor Storage = 71.95%

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(1) Assumes completion of Danforth Garage conversion to indoor storage.

Exhibit 7-6

INDOOR STORAGE FACILITIES RECENTLY CONSTRUCTED BY ONTARIO TRANSIT SYSTEMS

Transit System	Indoor Storage Space (Sq. Ft.)	Indoor Storage Capacity (# of Buses)
BELLEVILLE	7,125	20
CORNWALL	15,429	30
KITCHENER	68,307	120
OTTAWA	96,955	180
PICKERING	8,788	30
SARNIA	24,004	40
STRATFORD	7,756	16
THUNDER BAY	40,032	55
TIMMINS	20,156	36
TORONTO		
- Wilson	150,312	300
- Malvern	124,696	250
- Arrow Road	132,019	250
- Danforth (1)	36,757	141
WELLAND	5,671	12

(1) Assumes conversion of Danforth Garage to indoor storage as per current plans.

SOURCE: Ontario Ministry of Transportation and Communications (MTC), Transit Bus Garages Constructed in Ontario, Transit Office, April, 1977.

system. On the regular transit system, if the scheduled number of vehicles is not operated due to problems with vehicle maintenance or weather, transit users face increased wait time at bus stops and increased crowding. If a Wheel-Trans vehicle scheduled for service cannot go out and no other replacement is available an individual's trip may not be accommodated or they may wait several hours for an alternative vehicle. This is unlike the conventional fixed-route service where there would be another bus arriving five or ten minutes later.

Outdoor storage directly affects vehicle reliability in a number of ways:

- vehicles, once washed and stored in freezing temperatures, commonly experience such problems as frozen exit doors, broken windshield wipers, frozen mirrors/windows (which can obscure a driver's vision), and frozen air units. Vehicles such as the Orion II, which are equipped with hydraulic kneeling suspensions, will experience freeze-up failures directly related to storage in sub-zero temperatures;
- outdoor storage increases wear and tear on mechanical parts which require circulation of lubricants at specific temperatures (e.g. engines, power steering, transmissions). In some cases, cold vehicles will not shift gears and require extended idling by drivers leading to delays in putting vehicles into service;
- to reduce the number of vehicles which will not start in the morning due to outdoor storage in cold temperatures, it is not uncommon to idle a vehicle several times throughout the night including 30-60 minutes prior to entering service. This puts a severe strain on batteries and starting systems.

As well, it is assumed that idling of buses has an effect on engine life equivalent to in-service operation;

- starting aids used in cold weather cause major engine failures (cracked heads, broken pistons and rods, ruptured gaskets);
- inspection, servicing and cleaning of buses stored outside is more difficult. Poor troubleshooting and lack of corrective action can lead to a higher incidence of road calls; and
- increased absenteeism among mechanics, poor driver morale, decreased service and maintenance productivity can all affect vehicle reliability in the long run.

In short, if vehicle reliability is at all a priority, indoor storage of vehicles is essential.

(b) Rider Comfort

The users of Wheel-Trans include people with a wide range of disabilities that could be affected by cold temperatures. It is anticipated that Wheel-Trans users are more sensitive to cold weather than regular TTC patrons yet Wheel-Trans vehicles are currently stored outdoors. Indoor storage of Wheel-Trans vehicles at temperatures of 50°F or higher would substantially improve the comfort afforded Wheel-Trans users in the morning hours.

(c) Vehicle Life

The Orion II fleet will represent an investment of $14.5 million by the end of 1988. The reason Orion II vehicles cost approximately $140,000 is that they are designed to transit industry standards and are expected to last 12-15 years. Transit industry experience suggests that vehicles stored indoors last longer. If the capital investment in the Orion II is to be protected and the extended vehicle life resulting from such a capital investment is to be realized indoor storage of vehicles would be prudent. The investment by Metro and the Province in the Orion II, present and future, should be protected.

(d) Environmental Impacts

Idling of buses outdoors during cold weather to ensure that vehicles will start in the morning results in significant air pollution and noise. Noise and air pollution caused by idling buses is one of the major reasons the TTC has decided to cover over Danforth Garage. As all new garages must satisfy the requirements of the Provincial Environmental Assessment Act, outdoor storage of vehicles would be difficult to justify based on environmental impacts.

7.3.4 Summary

In conclusion, the construction of single garage with indoor storage of vehicles (Option 3) will result in improved vehicle reliability, increased rider comfort, longer vehicle life and reduced environmental disruption and is superior to all other options from an operational perspective.

7.4 Radio System Requirements

In 1984, All-Way Transportation supplied a radio system as part of their contract to provide the Wheel-Trans service. The radio channel to be used (VHF) was for the exclusive use of Wheel-Trans (i.e. All-Way could not use it for their school buses). Early in 1984, All-Way replaced all of their existing Wheel-Trans radio equipment with new UHF equipment. It is assumed that this change was initiated since the Department of Communications (DOC) could not make a new channel available in the VHF band.

The following options for future radio communications were evaluated:

1. Use existing Wheel-Trans radio equipment and channel;
2. Purchase new radio equipment for use on an existing TTC channel;
3. Purchase new radio equipment and obtain a new radio channel; and
4. Cellular Telephones.

The advantages and disadvantages of each option are detailed in Appendix H and described below.

For the purposes of comparing costs, it was assumed that one radio channel is sufficient for the Wheel-Trans operation although mobile radio costs are for two channel equipment to cover future needs. For a fleet of 125 vehicles, a total of 134 radios would have to be purchased including 7 percent spares for maintenance. Also, Wheel-Trans may have a requirement in the future to use data transmission to/from vehicles. Costs have not been included for data transmission capabilities in this report.

It appears at this time, that the best option would be to purchase new radio equipment for all vehicles and to acquire a base radio system capable of communicating exclusively with Wheel-Trans vehicles (i.e. Options 2 or 3) at an estimated capital cost of $360,000. Option 4 has been ruled out due to high capital and maintenance costs while Option 1 is not preferred since the channel and equipment is not duplex. It is unclear at this time whether a new channel or an existing channel will be utilized by Wheel-Trans. This will require more detailed consideration by TTC staff and negotiations with DOC.

It should be noted that obtaining approval from the Federal Department of Communications for use of a radio channel has proven to be a very lengthy process taking 6 to 18 months depending on the complexity of the request.

If Option 3 is preferred, the estimated time frame for implementation is twelve months plus negotiating time with the Department of Communications. Assuming this process will take 8 months, the total estimated time frame could be up to 20 months for installation of a new radio system. This could result in the radio system not being in place in time for October 31, 1988. It may be necessary, in this instance, to rent the existing equipment from All-Way for a short period of time. If Option 2 is preferred, a new radio system can likely be in place prior to October 31, 1988.

7.5 Conclusions

The operational advantages of a single garage combined with the financial cost-effectiveness and desirability of indoor storage clearly point out the superiority of Option 3 (a central garage with indoor storage). In terms of radio equipment, purchase of new radio equipment with a duplex radio frequency is preferred. The following chapter outlines some of the implementation issues associated with full integration of Wheel-Trans and the construction of a garage.

8.0 IMPLEMENTATION ISSUES

8.1 Introduction

If the TTC is to assume full responsibility for the operation of Wheel-Trans, several issues must be resolved including the following:

- timing of full integration;
- timing for the construction of a garage and the possible exemption of such a garage from the Environmental Assessment Act;
- temporary Wheel-Trans maintenance facilities;
- provision of radio facilities; and
- labour relations issues;

Each of the above issues is discussed separately in the following sections.

8.2 Timing of Full Integration

The TTC's current contract with All-Way expires on October 31, 1988. As outlined in Section 8.3, it is not possible to construct a Wheel-Trans garage prior to the above date. Given the above, there are two main options for the timing of a takeover:

(a) Assume the contractors responsibilities on expiration of the current contract; or

(b) Extend the current contract by negotiation for a length of time appropriate for the completion of a Wheel-Trans garage.

In analyzing the above two options, it is apparent that both have advantages and disadvantages. In Option 1, a temporary Wheel-Trans facility would be required pending the completion of a Wheel-Trans garage. This would involve Wheel-Trans operations moving into a temporary facility followed by another move upon completion of the new garage. The second move would be much less disruptive than the first move or a changeover in contractors, as there would be no changes in staff, no new vehicles, no need to educate a new contractor, etc. However, the potential disruptions to service due to two separate but unavoidable moves is not desirable from an operational point-of-view.

Alternatively, Option 2 provides only a single disruption to Wheel-Trans operations although it is anticipated that the contractor will wish to negotiate an increase in the cost per hour for any extension of the contract. However, TTC experience with a contractor at the conclusion of a contract has not been favourable as the quality of service tends to suffer in the later months. Under Option 2, the contractor will have 24 months of notice that the contract will not be renewed compared to approximately 12 months for Option 1.

Overall, the impact of two separate moves is considered to be less than the impact of 24 month notice to the contractor that the service will not be renewed. Based on the above, Option 1 is preferred namely assumption of the contract on October 31, 1988 with provision of temporary garage facilities until a new garage is ready for Wheel-Trans.

8.3 Timing for the Provision of Maintenance Facilities

The TTC's Engineering and Construction Branch estimate that with an exemption from the Environmental

Assessment Act, the earliest possible date for the completion of a garage is April, 1990 (see Exhibit 8-1). Without an EA exemption, the completion date for the garage would be pushed back to November, 1990 (see Exhibit 8-2). The above estimates are based on quick approval of full integration of Wheel-Trans by Metropolitan Toronto and the Province, availability of capital funds in the 1988-1990 time period and an intensive construction schedule. Construction of a garage in a shorter period of time is not practical and would have serious impacts on cost and proper design.

8.4 Temporary Maintenance Facilities

As outlined in Chapter 7, the storage and maintenance of Wheel-Trans vehicles at existing TTC garages is not a viable long-term solution. However, the current construction of the Arrow Road Bus Garage offers the opportunity to minimize any costs to temporarily accommodate Wheel-Trans vehicles by consolidating the Wheel-Trans fleet at a single location.

Temporary use of the Arrow Road garage by Wheel-Trans for approximately 12 months is considered to be the only realistic alternative given the October 31, 1988 deadline. The TTC's current order of articulated buses could also be stored and maintained at the Arrow Road location. While the operation of a mixed fleet is problematic as mentioned previously, in the very short term, the problems are felt to be manageable. With only 30 to 60 unique articulated buses at Arrow Road, there would be sufficient room to provide separate servicing and parking areas for both the articulated fleet and Wheel-Trans fleet.

Due to the short time frame in which Wheel-Trans will require use of Arrow Road, any costs to modify the facility to accept Wheel-Trans vehicles must be kept to a

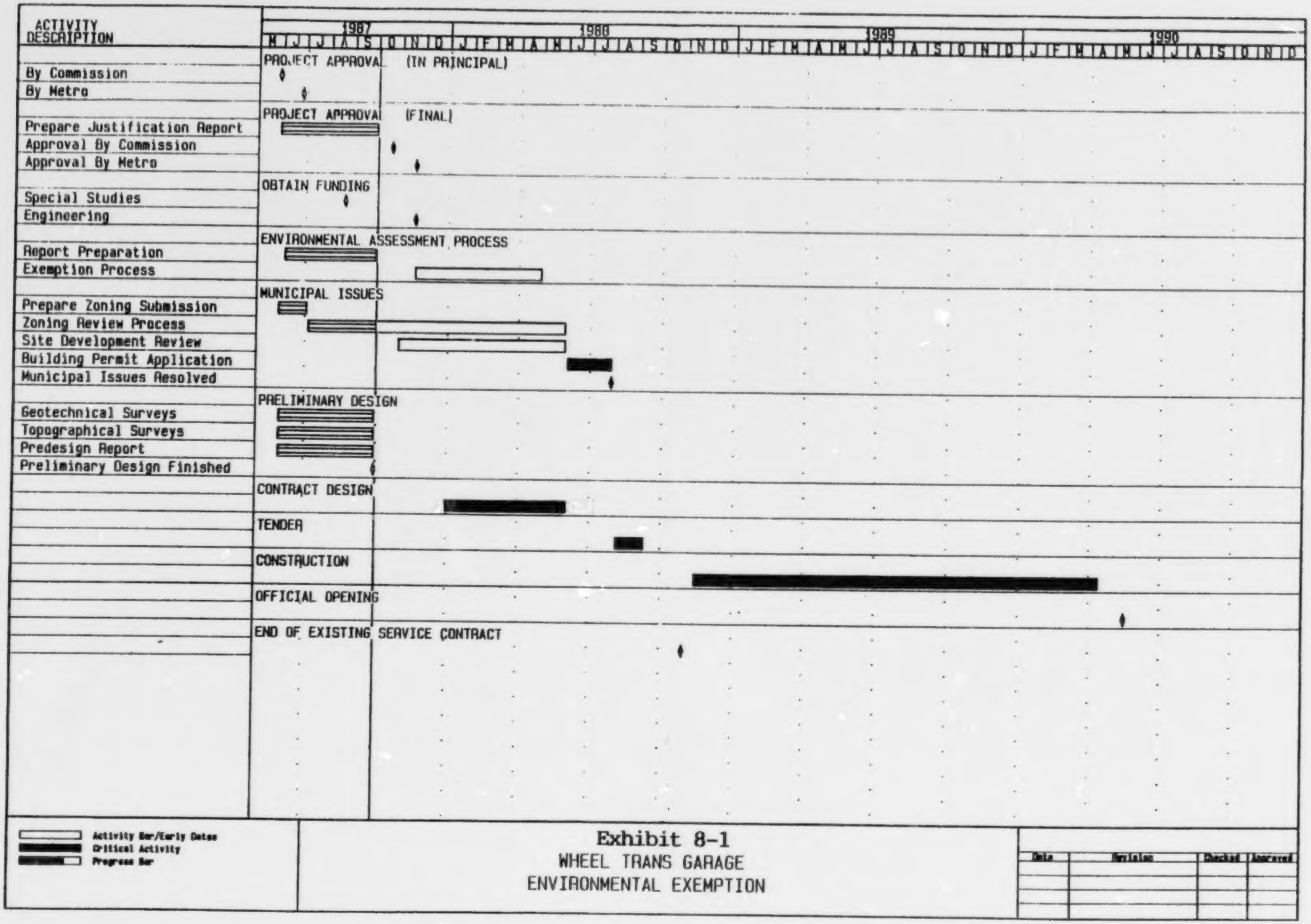


Exhibit 8-1
WHEEL TRANS GARAGE
ENVIRONMENTAL EXEMPTION

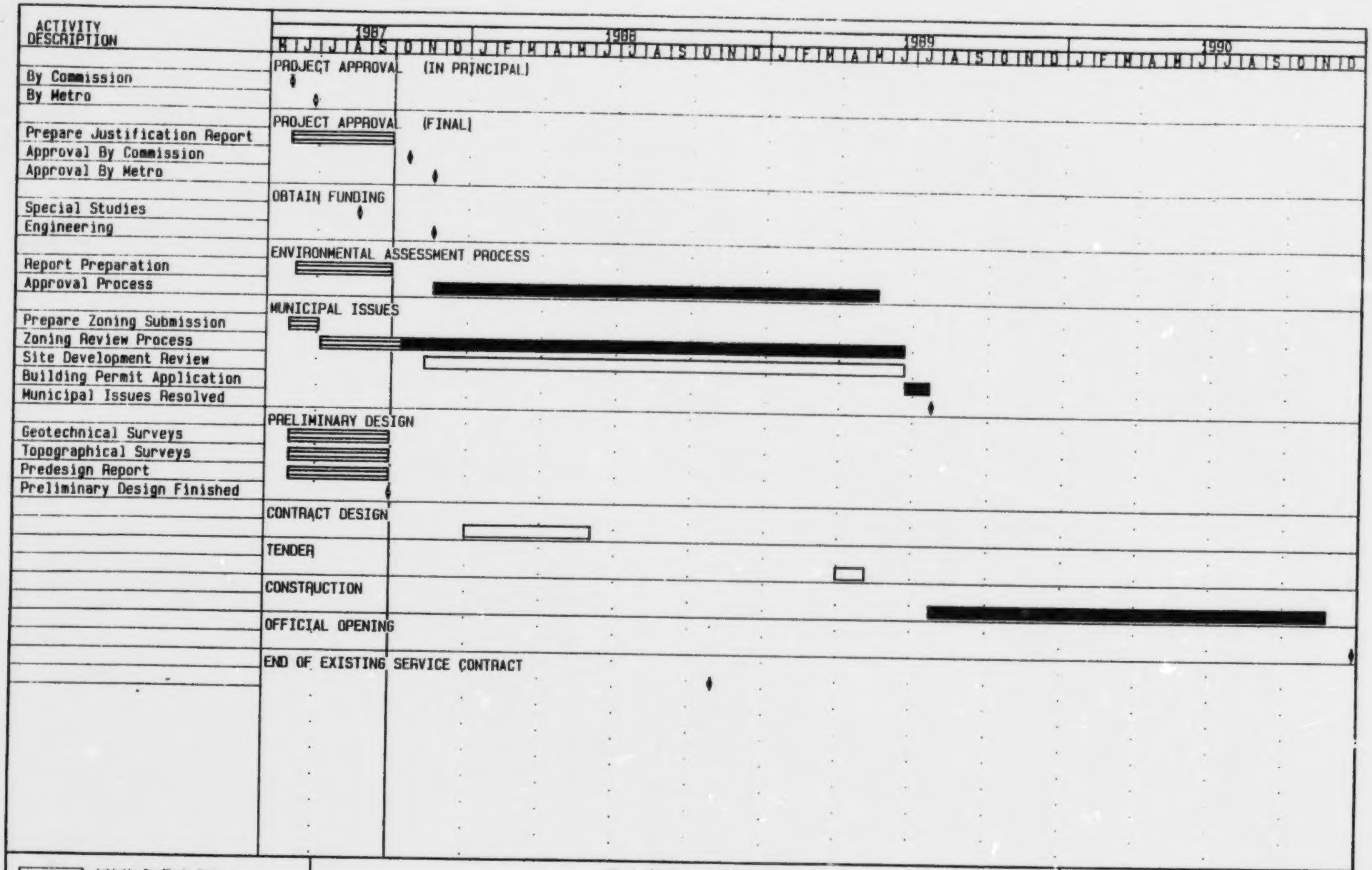


Exhibit 8-2
WHEEL TRANS GARAGE
FULL ENVIRONMENTAL ASSESSMENT

Date	Revision	Checked	Approved

minimum. Taking into consideration garage modifications to accommodate Wheel-Trans type vehicles and additional costs for a second move to a permanent Wheel-Trans location, costs of $80,000 are anticipated. This is comprised of $20,000 in moving costs and $60,000 in modification costs.

8.5 Capital Subsidy for Garage Construction

The Ontario Ministry of Transportation and Communications (MTC) subsidizes Wheel-Trans capital and operating costs. The Provincial subsidy level for capital expenditures for transit vehicles for the disabled is currently 50 percent of eligible expenditures. Since the TTC is the first Ontario transit property to propose the construction of a transit facility for disabled transit operations (i.e. a garage), the level of provincial funding for such facilities has never been established. The TTC currently receives a 75 percent subsidy from MTC for the construction of regular transit garages and has advocated that this level of funding should apply to future Wheel-Trans garage facilities as well. In response to the above, MTC recently indicated that a 75 percent subsidy rate towards the construction of a Wheel-Trans garage would receive favourable consideration.

8.6 Provision of Radio Facilities

The longest lead-time task is the Federal Department of Communications' approval of a radio frequency and the implementation of the communications system. While the 20 months required for the above approval is well within the timeframe required for garage design and construction, it would not be in place in time for the October 31, 1988 takeover. Rental of existing equipment from All-Way may need to be pursued in the event that the necessary approvals cannot be obtained prior to October 31, 1988.

8.7 Labour Relations Issues

The 1987 Memorandum of Agreement to renew the Collective Agreement between the Commission and Local 113 includes a letter to Local 113 which states as follows:

> "This will confirm our advice to you that if and when the TTC takes over the operation of Wheel-Trans, ATU - Local 113 will be recognized as bargaining agent for those employed by the TTC in the Wheel-Trans operations. In addition, and in order to assist in an orderly transition of the Wheel-Trans operations from All-Way Transportation to the TTC, the TTC will engage in discussions with Local 113 pertaining to employees involved in the Wheel-Trans operations."

If and when a decision is made to fully integrate the Wheel-Trans operation, appropriate discussions will be initiated with Local 113 concerning work rules, wage rates, etc.

9.0 CONCLUSIONS AND RECOMMENDATIONS

As noted previously, the operating cost difference between TTC and contracted operation is between 1 and 5 percent over a 10 year period. With the contractor's costs of materials being identical to that of the TTC (and for example, in the case of fuel, probably being higher), it will be more difficult in the future to obtain a cost advantage under contracting out. It is anticipated that the current contractor's labour costs will continue to increase at a rate higher than inflation as unionized staff bargain for parity with the TTC employees. This will narrow the gap between the cost of TTC and contracted operation even further.

While a higher difference in operating costs between the TTC and the contractor could be expected due to the current difference in wage rates, several factors explain the modest difference in annual costs:

- All-Way contracts out a large portion of its servicing and maintenance functions. These costs, which are built into the cost per hour paid to the contractor, include the profit margins of the sub-contractors;
- All-Way itself must make a return on its investment and also includes its own profit margin in the cost per hour charged to the TTC;
- All-Way's direct operating costs include the cost of capital (albeit for a modest infrastructure);
- The cost-effectiveness of TTC operation of Wheel-Trans improves over time; and
- All-Way must make a substantial capital investment in future years to improve existing facilities and expand garage capacity to meet future growth.

While it is realized that the cost of a TTC garage is a major investment in Wheel-Trans, as demonstrated previously, indoor storage of vehicles and proper daily and preventative maintenance is essential if the expected vehicle life of the existing fleet is to be attained. With the Commission's current and future investment in vehicles and the current problems with service quality and reliability, it would seem prudent for the TTC to protect the taxpayers' investment through sound maintenance practices and the provision of proper maintenance facilities.

It should be emphasized that the TTC has no direct financial stake in the Wheel-Trans service. It must, therefore, make any recommendations for major expenditures based on its long-standing obligation to the community it serves and to which it is accountable. The TTC believes that the disabled community will be well-served by full integration and that it recognizes that the modest costs of integration are necessary. Wheel-Trans users have long since advocated the takeover of Wheel-Trans by the TTC and, while desirous of additional service being supplied, have made a full takeover one of their top priorities.

Finally, the preceeding analysis demonstrates that a single garage (with indoor storage) is the best alternative both from a financial perspective and an operational point-of-view. All costs for a garage are based on the need to maintain and store 250 vehicles. A 250 vehicle garage facility was assumed based on fleet size estimates of 200 vehicles in 1992 and on the assumption of continued ridership growth beyond 1992 until ridership per capita reaches 0.6 trips in 1997 necessitating a fleet of over 250 vehicles. This target is based on MTC estimates of a mature ridership for a disabled transit system as evidenced by the ridership experienced by other Ontario transit systems.

Based on the above the following recommendations are made:

1. that the TTC assume full responsibility for the Wheel-Trans service upon termination of the current contract on October 31, 1988;
2. that the TTC continue design work on a Wheel-Trans garage, to be located on Metro-owned lands at Allen Road and Sheppard Avenue;
3. that the Wheel-Trans garage be constructed to maintain and store 250 vehicles;
4. that the necessary modifications be made to the Arrow Road bus garage to accommodate Wheel-Trans vehicles temporarily from October 31, 1988 to September, 1989;
5. that the TTC continue efforts to obtain the necessary approvals for full integration including project funding, zoning, radio communications, exemption from the Environmental Assessment Act, release of Allen Road lands and union negotiations; and
6. that the report be forwarded to the Metropolitan Toronto Transportation Committee for approval.

Appendix A

DESCRIPTION OF MAINTENANCE FACILITY REQUIREMENTS FOR A CENTRAL GARAGE

A central Wheel-Trans Garage has been costed on the basis of the following operating and space requirements:

(a) Operation

Vehicles returning from service will be picked up from the backup area by garage personnel and taken through the following service procedures:

- Inspection;
- Refueling;
- Internal cleaning of vehicles; and
- External washing of vehicles.

They will then be parked in the vehicle storage area ready for further service. The garage facility will be laid out in such a manner as to keep the travel distances for both vehicles and staff to a minimum.

(b) Allocation of Space

Garage Staff and Drivers

An office area of 1,415 square metres is required for the garage staff and drivers.

This space will be sub-divided into the following areas:

- Private offices;
- General offices;
- Wash rooms;
- Locker rooms;
- Lunch room;
- Driver's waiting area;
- Driver's recreation area;
- Sign-up room; and
- Janitor's room;

Vehicle Backup Area

An outside backup area is required for 175 vehicles. Assuming a vehicle mix of 80% Orion II's and 20% small vehicles, an area of 4,300 square metres will be required. This area should be conveniently located between the entrance driveway and the service area.

Service Area

Two service lines will be required for the ultimate fleet of 250 vehicles. Vehicles brought from the backup area are first refueled, oil levels topped up and cleaned internally. These operations can all be performed on the service line with the exception of the refueling of gasoline-powered vehicles, which must be performed outdoors. The vehicles are then washed externally.

The facilities required for this function are:

(a) Outdoor gasoline refueling station;

(b) Indoor diesel refueling station;

(c) Portable vacuum cleaning equipment and facilities for floor washing;

(d) External wash facility; and

(e) Material storage area.

The total floor space required is 1,545 square metres.

Vehicle Storage Area

A vehicle storage area with a capacity of 175 Orion II and 75 smaller vehicles is required for vehicles which have been serviced and are ready for further duty. This area should be totally enclosed and heated to avoid the necessity of idling the engines during cold weather and so reduce air pollution and noise levels.

The floor area required is 7,400 square metres.

Vehicle Maintenance Facilities

A maintenance area for the repair of vehicles is required. The major components of this area area:

- 12 hoists;
- 2 pits;
- Degreasing area;
- Body repair area;
- Paint and spray area;
- Offices;
- Stoves;
- Locker room; and
- Lunch room.

The total floor area required is 4,300 square metres.

Building Maintenance

Plant Department will provide janitorial service for the office areas only. A cleaner's room with some storage space will be provided adjacent to the washrooms for this purpose.

Floor cleaning in the shops and garage and snow cleaning will be the responsibility of the Equipment Department and does not require any additional floor space.

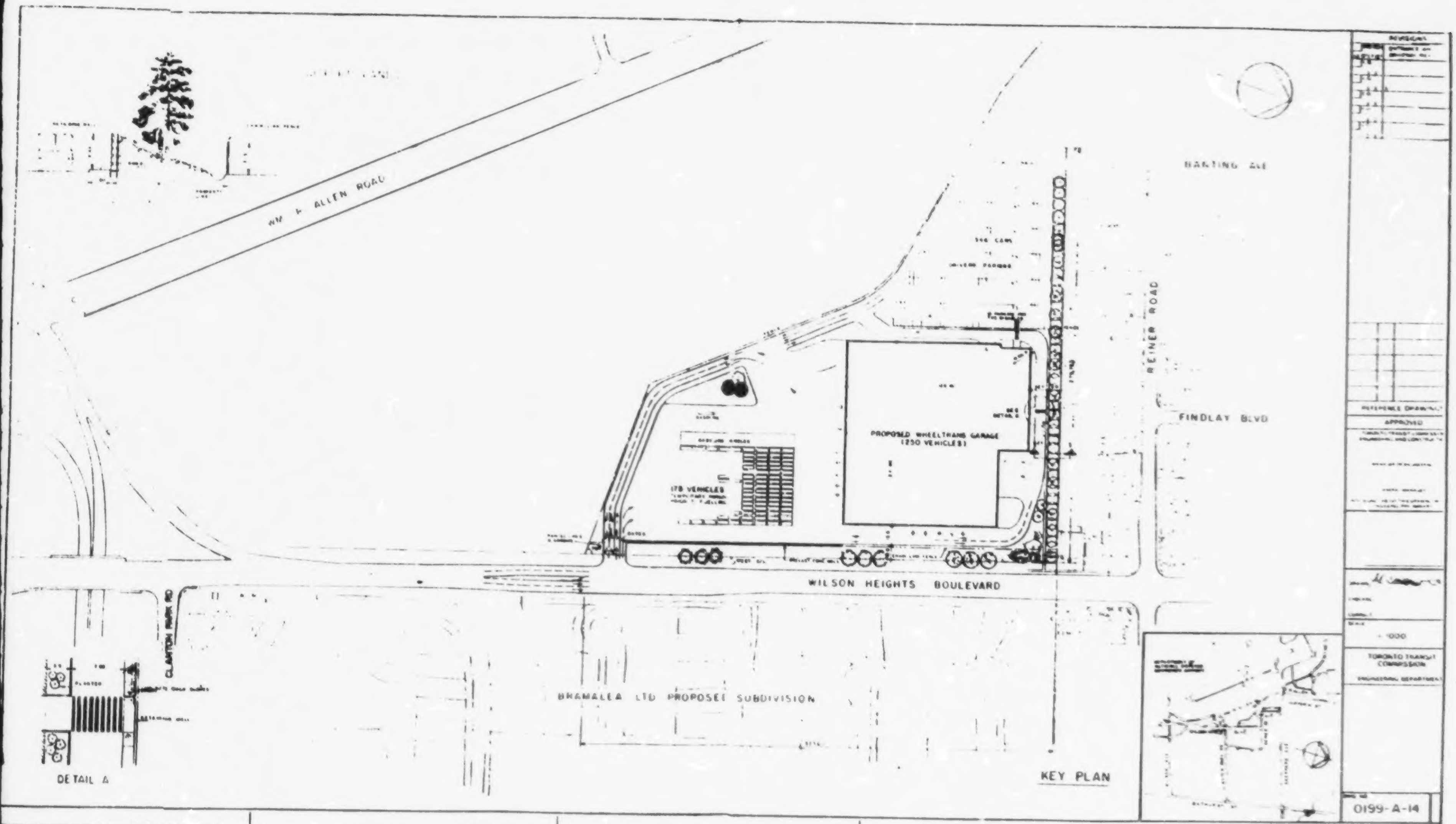
Car Parking

A total of 350 outdoor parking spaces are required for operators and staff based on the operation of the 250 vehicle garage.

Miscellaneous Work and Equipment

The following specialized equipment would be required:

Service Vehicles	Emergency Truck Stake Truck
Mobile Shop Equipment	Fork Lift Tractor Sweeper Snow Plow Equipment
Garage Tools and Capital	Non-Capital Purchase
Purchase Machinery	Shop-made Equipment
Office Furniture & Equipment	Equipment Department Transportation Department
Safety and Security Dept.	Equipment & Signs Watchman Service
Plant Department	Garbage Containers UHF Radio System Bell Canada Inst. Engineering & Installation Incl. Material Costs

WM. R. ALLEN ROAD
BANTING AVE
REINER ROAD
FINDLAY BLVD
WILSON HEIGHTS BOULEVARD
CLANTON PARK RD
PROPOSED WHEELTRANS GARAGE
(250 VEHICLES)
178 VEHICLES
BRAMALEA LTD PROPOSED SUBDIVISION
DETAIL A
KEY PLAN
REFERENCE DRAWINGS
APPROVED
1:1000
TORONTO TRANSIT COMMISSION
ENGINEERING DEPARTMENT
0199-A-14

Appendix A

Appendix B

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER LIFE OF ASSET

WHEEL-TRANS

Year	Operating Costs (1987 $)	Capital Costs (1) (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$18,005,800	$ 0	$18,005,800	1.00000	$18,005,800
1988	19,088,600	536,950	19,625,550	0.95455	18,733,480
1989	20,932,800	536,950	21,469,750	0.91116	19,562,314
1990	22,113,500	536,950	22,650,450	0.86974	19,700,020
1991	23,511,800	536,950	24,048,750	0.83021	19,965,444
1992	24,716,800	536,950	25,253,750	0.79247	20,012,850
1993	26,119,600	536,950	26,656,550	0.75645	20,164,322
1994	27,315,300	536,950	27,852,250	0.72207	20,111,135
1995	28,712,600	536,950	29,249,550	0.68924	20,160,073
1996	29,903,000	536,950	30,439,950	0.65791	20,026,888
	$240,419,800	$4,832,550	$245,252,350		$196,442,325
				Annualization Factor	0.1344
				Annualized Cost	$26,401,848

FOOTNOTE:

(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over life of asset (40 years).

Appendix B (Continued)

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER LIFE OF ASSET

CONTRACTOR (ALL-WAY): 1 - ELIMINATION OF WAGE GAP IN FIVE YEARS

Year	Operating Costs (1987 $)	Capital Costs (1987 $) (1)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$0	$16,198,732	1.00000	$16,198,732
1988	18,233,518	312,500	18,546,018	0.95455	17,703,017
1989	20,608,341	312,500	20,920,841	0.91116	19,062,171
1990	22,480,331	312,500	22,792,831	0.86974	19,823,855
1991	24,397,190	312,500	24,709,690	0.83021	20,514,161
1992	26,358,916	312,500	26,671,416	0.79247	21,136,309
1993	27,972,911	312,500	28,285,411	0.75645	21,396,472
1994	29,586,906	312,500	29,899,406	0.72207	21,589,315
1995	31,200,900	312,500	31,513,400	0.68924	21,720,418
1996	32,815,094	312,500	33,127,594	0.65791	21,795,128
	$249,852,839	$2,812,500	$252,665,339		$200,939,577
				Annualization Factor	0.1344
				Annualized Cost	$27,006,279

(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over life of asset (40 years).

Appendix B (Continued)

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER LIFE OF ASSET CONTRACTOR (ALL-WAY): 2 - ELIMINATION OF 80 PERCENT OF WAGE GAP IN FIVE YEARS (NO WAGE PARITY)

Year	Operating Costs (1987 $)	Capital Costs (1) (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$0	$16,198,732	1.00000	$16,198,732
1988	18,233,518	312,500	18,546,018	0.95455	17,703,017
1989	20,608,341	312,500	20,920,841	0.91116	19,062,171
1990	22,480,331	312,500	22,792,831	0.86974	19,823,855
1991	24,397,190	312,500	24,709,690	0.83021	20,514,161
1992	25,988,749	312,500	26,301,249	0.79247	20,842,962
1993	27,580,310	312,500	27,892,810	0.75645	21,099,490
1994	29,171,870	312,500	29,484,370	0.72207	21,289,632
1995	30,763,430	312,500	31,075,930	0.68924	21,418,894
1996	32,355,190	312,500	32,667,690	0.65791	21,492,550
	$247,777,661	$2,812,500	$250,590,161		$199,445,464
			Annualization Factor		0.1344
			Annualized Cost		$26,805,470

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(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over life of asset (40 years).

Appendix B (Continued)

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER LIFE OF ASSET

CONTRACTOR (ALL-WAY): 3 - NO NARROWING OF WAGE GAP

Year	Operating Costs (1987 $)	Capital Costs (1) (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$0	$16,198,732	1.00000	$16,198,732
1988	17,967,004	312,500	18,279,504	0.95455	17,448,617
1989	20,002,614	312,500	20,315,114	0.91116	18,510,259
1990	21,504,437	312,500	21,816,937	0.86974	18,975,080
1991	23,006,260	312,500	23,318,760	0.83021	19,359,401
1992	24,508,082	312,500	24,820,582	0.79247	19,669,577
1993	26,009,905	312,500	26,322,405	0.75645	19,911,558
1994	27,511,728	312,500	27,824,228	0.72207	20,090,901
1995	29,013,550	312,500	29,326,050	0.68924	20,212,800
1996	30,515,573	312,500	30,828,073	0.65791	20,282,239
	$236,237,885	$2,812,500	$239,050,385		$190,659,166
				Annualization Factor	0.1344
				Annualized Cost	$25,624,592

FOOTNOTE:

(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over life of asset (40 years).

Appendix C

CALCULATION OF ANNUALIZED COST/LUMP SUM CAPITAL EXPENDITURES

WHEEL-TRANS

Year	Operating Costs (1987 $)	Capital Costs (1) (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$18,005,800	$ 0	$18,005,800	1.00000	$18,005,800
1988	19,088,600	6,443,400	25,532,000	0.95455	24,371,455
1989	20,932,800	15,034,600	35,967,400	0.91116	32,771,949
1990	22,113,500	0	22,113,500	0.86974	19,233,013
1991	23,511,800	0	23,511,800	0.83021	19,519,664
1992	24,716,800	0	24,716,800	0.79247	19,587,333
1993	26,119,600	0	26,119,600	0.75645	19,758,147
1994	27,315,300	0	27,315,300	0.72207	19,723,422
1995	28,712,200	0	28,712,600	0.68924	19,789,983
1996	29,903,000	0	29,903,000	0.65791	19,673,620
	$240,419,800	$21,478,000	$261,897,800		$212,434,387

Annualization Factor	0.1344
Annualized Cost	$28,551,182

FOOTNOTE:

(1) Assumes lump sum capital expenditures in 1988-89 for construction of contractor and TTC garage facilities.

Appendix C (Continued)

CALCULATION OF ANNUALIZED COST/LUMP SUM CAPITAL EXPENDITURES
CONTRACTOR (ALL-WAY): 1 - ELIMINATION OF WAGE GAP IN FIVE YEARS

Year	Operating Costs (1987 $)	Capital Costs (1987 $) (1)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$ 0	$16,198,732	1.00000	$16,198,732
1988	18,233,518	6,250,000	24,483,518	0.95455	23,370,631
1989	20,608,341	6,250,000	26,858,341	0.91116	24,472,166
1990	22,480,331	0	22,480,331	0.86974	19,552,061
1991	24,397,190	0	24,397,190	0.83021	20,254,721
1992	26,358,916	0	26,358,916	0.79247	20,888,662
1993	27,972,911	0	27,972,911	0.75645	21,160,082
1994	29,586,906	0	29,586,906	0.72207	21,363,669
1995	31,200,900	0	31,200,900	0.68924	21,505,029
1996	32,815,094	0	32,815,094	0.65791	21,589,529
	$249,852,839	$12,500,000	$262,352,839		$210,355,282
				Annualization Factor	0.1344
				Annualized Cost	$28,271,750

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(1) Assumes lump sum capital expenditures in 1988-89 for construction of contractor and TTC garage facilities.

Appendix C (Continued)

CALCULATION OF ANNUALIZED COST/LUMP SUM CAPITAL EXPENDITURES
CONTRACTOR (ALL-WAY): 2 - ELIMINATION OF 80 PERCENT OF WAGE GAP IN FIVE YEARS (NO WAGE PARITY)

Year	Operating Costs (1987 $)	Capital Costs (1987 $) (1)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$ 0	$16,198,732	1.00000	$16,198,732
1988	18,233,518	6,250,000	24,483,518	0.95455	23,370,631
1989	20,608,341	6,250,000	26,858,341	0.91116	24,472,166
1990	22,480,331	0	22,480,331	0.86974	19,552,061
1991	24,397,190	0	24,397,190	0.83021	20,254,721
1992	25,988,749	0	25,988,749	0.79247	20,595,315
1993	27,580,310	0	27,580,310	0.75645	20,863,099
1994	29,171,870	0	29,171,870	0.72207	21,063,986
1995	30,763,430	0	30,763,430	0.68924	21,203,506
1996	32,355,190	0	32,355,190	0.65791	21,286,952
	$247,777,661	$12,500,000	$260,277,661		$208,861,169
				Annualization Factor	0.1344
				Annualized Cost	$28,070,941

(1) Assumes lump sum capital expenditures in 1988-89 for construction of contractor and TTC garage facilities.

CALCULATION OF ANNUALIZED COST/LUMP SUM CAPITAL EXPENDITURES

CONTRACTOR (ALL-WAY): 3 - NO NARROWING OF WAGE GAP

Year	Operating Costs (1987 $)	Capital Costs (1987 $)(1)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$ 0	$16,198,732	1.00000	$16,198,732
1988	17,967,004	6,250,000	24,217,004	0.95455	23,116,231
1989	20,002,614	6,250,000	26,252,614	0.91116	23,920,254
1990	21,504,437	0	21,504,437	0.86974	18,703,286
1991	23,006,260	0	23,006,260	0.83021	19,099,961
1992	24,508,082	0	24,508,082	0.79247	19,421,930
1993	26,009,905	0	26,009,905	0.75645	19,675,168
1994	27,511,728	0	27,511,728	0.72207	19,865,256
1995	29,013,550	0	29,013,550	0.68924	19,997,411
1996	30,515,573	0	30,515,573	0.65791	20,076,641
	$236,237,885	$12,500,000	$248,737,885		$200,074,871
				Annualization Factor	0.1344
				Annualized Cost	$26,890,063

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(1) Assumes lump sum capital expenditures in 1988-89 for construction of contractor and TTC garage facilities.

Appendix D

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER LIFE OF CONTRACT

WHEEL-TRANS

Year	Operating Costs (1987 $)	Capital Costs (1987 $) (1)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$18,005,800	$ 0	$18,005,800	1.00000	$18,005,800
1988	19,088,600	2,386,444	21,475,044	0.95455	20,498,906
1989	20,932,800	2,386,444	23,319,244	0.91116	21,247,493
1990	22,113,500	2,386,444	24,499,944	0.86974	21,308,601
1991	23,511,800	2,386,444	25,898,244	0.83021	21,500,907
1992	24,716,800	2,386,444	27,103,244	0.79247	21,478,520
1993	26,119,600	2,386,444	28,506,044	0.75645	21,563,370
1994	27,315,300	2,386,444	29,701,744	0.72207	21,446,590
1995	28,712,600	2,386,444	31,099,044	0.68924	21,434,825
1996	29,903,000	2,386,444	32,289,444	0.65791	21,243,697
	$240,419,800	$21,477,996	$261,897,796		$209,728,708
			Annualization Factor		0.1344
			Annualized Cost		$28,187,538

FOOTNOTE:

(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over life of assumed contract (nine years).

Appendix D (Continued)

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER LIFE OF CONTRACT

CONTRACTOR (ALL-WAY): 1 - ELIMINATION OF WAGE GAP IN FIVE YEARS

Year	Operating Costs (1987 $)	Capital Costs[1] (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$ 0	$16,198,732	1.00000	$16,198,732
1988	18,233,518	1,388,888	19,622,406	0.95455	18,730,478
1989	20,608,341	1,388,888	21,997,229	0.91116	20,042,930
1990	22,480,331	1,388,888	23,869,219	0.86974	20,760,034
1991	24,397,190	1,388,888	25,786,078	0.83021	21,407,786
1992	26,358,916	1,388,888	27,747,804	0.79247	21,989,314
1993	27,972,911	1,388,888	29,361,799	0.75645	22,210,705
1994	29,586,906	1,388,888	30,975,794	0.72207	22,366,537
1995	31,200,900	1,388,888	32,589,788	0.68924	22,462,312
1996	32,815,094	1,388,888	34,203,982	0.65791	22,503,299
	$249,852,839	$12,499,992	$262,352,831		$208,672,126
			Annualization Factor		0.1344
			Annualized Cost		$28,045,534

FOOTNOTE:

(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over life of assumed contract (nine years).

Appendix D (Continued)

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER LIFE OF CONTRACT CONTRACTOR (ALL-WAY): 2 - ELIMINATION OF 80 PERCENT OF WAGE GAP IN FIVE YEARS (NO WAGE PARITY)

Year	Operating Costs (1987 $)	Capital Costs (1987 $) (1)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,743	$ 0	$16,198,732	1.00000	$16,198,732
1988	18,233,518	1,388,888	19,622,406	0.95455	18,730,478
1989	20,608,341	1,388,888	21,997,229	0.91116	20,042,930
1990	22,480,331	1,388,888	23,869,219	0.86974	20,760,034
1991	24,397,190	1,388,888	25,786,078	0.83021	21,407,786
1992	25,988,749	1,388,888	27,377,637	0.79247	21,695,968
1993	27,580,310	1,388,888	28,969,198	0.75645	21,913,722
1994	29,171,870	1,388,888	30,560,758	0.72207	22,066,854
1995	30,763,430	1,388,888	32,152,318	0.68924	22,160,788
1996	32,355,190	1,388,888	33,744,078	0.65791	22,200,722
	$247,777,661	$12,499,992	$260,277,653		$207,178,013
			Annualization Factor		0.1344
			Annualized Cost		$27,844,725

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(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over life of assumed contract (nine years).

Appendix D (Continued)

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER LIFE OF CONTRACT

CONTRACTOR (ALL-WAY): 3 - NO NARROWING OF WAGE GAP

Year	Operating Costs (1987 $)	Capital Costs (1) (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$ 0	$16,198,732	1.00000	$16,198,732
1988	17,967,004	1,388,888	19,355,892	0.95455	18,476,079
1989	20,002,614	1,388,888	21,391,502	0.91116	19,491,017
1990	21,504,437	1,388,888	22,893,325	0.86974	19,911,259
1991	23,006,260	1,388,888	24,395,148	0.83021	20,253,026
1992	24,508,082	1,388,888	25,896,970	0.79247	20,522,583
1993	26,009,905	1,388,888	27,398,793	0.75645	20,725,791
1994	27,511,728	1,388,888	28,900,616	0.72207	20,868,123
1995	29,013,550	1,388,888	30,402,438	0.68924	20,954,694
1996	30,515,573	1,388,888	31,904,461	0.65791	20,990,411
	$236,237,885	$12,499,992	$248,737,877		$198,391,715
				Annualization Factor	0.1344
				Annualized Cost	$26,663,846

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(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over life of assumed contract (nine years).

Appendix E

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER 20 YEARS

WHEEL-TRANS

Year	Operating Costs (1987 $)	Capital Costs (1) (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$18,005,800	$ 0	$18,005,800	1.00000	$18,005,800
1988	19,088,600	1,073,900	20,162,500	0.95455	19,246,023
1989	20,932,800	1,073,900	22,006,700	0.91116	20,051,559
1990	22,113,500	1,073,900	23,187,400	0.86974	20,167,028
1991	23,511,800	1,073,900	24,585,700	0.83021	20,411,223
1992	24,716,800	1,073,900	25,790,700	0.79247	20,438,367
1993	26,119,600	1,073,900	27,193,500	0.75645	20,570,497
1994	27,315,300	1,073,900	28,389,200	0.72207	20,498,848
1995	28,712,600	1,073,900	29,786,500	0.68924	20,530,162
1996	29,903,000	1,073,900	30,976,900	0.65791	20,380,155
	$240,419,800	$9,665,100	$250,084,900		$200,299,663
			Annualization Factor		0.1344
			Annualized Cost		$26,920,275

FOOTNOTE:

(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over 20 years.

Appendix E (Continued)

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER 20 YEARS

CONTRACTOR (ALL-WAY): 1 - ELIMINATION OF WAGE GAP IN FIVE YEARS

Year	Operating Costs (1987 $)	Capital Costs[1] (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$ 0	$16,198,732	1.00000	$16,198,732
1988	18,233,518	625,000	18,858,518	0.95455	18,001,313
1989	20,608,341	625,000	21,233,341	0.91116	19,346,908
1990	22,480,331	625,000	23,105,331	0.86974	20,095,649
1991	24,397,190	625,000	25,022,190	0.83021	20,773,600
1992	26,358,916	625,000	26,983,916	0.79247	21,383,956
1993	27,972,911	625,000	28,597,911	0.75645	21,632,863
1994	29,586,906	625,000	30,211,906	0.72207	21,814,960
1995	31,200,900	625,000	31,825,900	0.68924	21,935,806
1996	32,815,094	625,000	33,440,094	0.65791	22,000,726
	$249,852,839	$5,625,000	$255,477,839		$203,184,513
				Annualization Factor	0.1344
				Annualized Cost	$21,307,999

FOOTNOTE:

(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over 20 years.

Appendix E (Continued)

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER 20 YEARS
CONTRACTOR (ALL-WAY): 2 - ELIMINATION OF 80 PERCENT OF WAGE GAP IN FIVE YEARS (NO WAGE PARITY)

Year	Operating Costs (1987 $)	Capital Costs (1) (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$0	$16,198,732	1.00000	$16,198,732
1988	18,233,518	625,000	18,858,518	0.95455	18,001,313
1989	20,608,341	625,000	21,233,341	0.91116	19,346,908
1990	22,480,331	625,000	23,105,331	0.86974	20,095,649
1991	24,397,190	625,000	25,022,190	0.83021	20,773,600
1992	25,988,749	625,000	26,613,749	0.79247	21,090,609
1993	27,580,310	625,000	28,205,310	0.75645	21,335,880
1994	29,171,870	625,000	29,796,870	0.72207	21,515,277
1995	30,763,430	625,000	31,388,430	0.68924	21,634,283
1996	32,355,190	625,000	32,980,190	0.65791	21,698,149
	$247,777,661	$5,625,000	$253,402,661		$201,690,400
				Annualization Factor	0.1344
				Annualized Cost	$27,107,190

FOOTNOTE:

(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over 20 years.

Appendix E (Continued)

CALCULATION OF ANNUALIZED COST-DEPRECIATION OVER 20 YEARS

CONTRACTOR (ALL-WAY): 3 - NO NARROWING OF WAGE GAP

Year	Operating Costs (1987 $)	Capital Costs[1] (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$16,198,732	$0	$16,198,732	1.00000	$16,198,732
1988	17,967,004	625,000	18,592,004	0.95455	17,746,913
1989	20,002,614	625,000	20,627,614	0.91116	18,794,995
1990	21,504,437	625,000	22,129,437	0.86974	19,246,874
1991	23,006,260	625,000	23,631,260	0.83021	19,618,840
1992	24,508,082	625,000	25,133,082	0.79247	19,917,224
1993	26,009,905	625,000	26,634,905	0.75645	20,147,949
1994	27,511,728	625,000	28,136,728	0.72207	20,316,547
1995	29,013,550	625,000	29,638,550	0.68924	20,428,189
1996	30,515,573	625,000	31,140,573	0.65791	20,487,838
	$236,237,885	$5,625,000	$241,862,885		$192,904,101
			Annualization Factor		0.1344
			Annualized Cost		$25,926,311

FOOTNOTE:

(1) Assumes capital expenditures for contractor and TTC garage facilities are depreciated over 20 years).

Appendix F

NET PRESENT VALUE ANALYSIS OF GARAGE OPTIONS

OPTION 2 - DISTRIBUTION AMONG TTC GARAGES (10% INTEREST, 5% INFLATION)

Year	Operating Costs (1987 $)	Capital Costs (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$ 0	$ 0	$ 0	1.00000	$ 0
1988	19,088,600	6,249,500	25,338,100	0.95455	24,186,368
1989	21,542,572	6,249,500	27,792,072	0.91116	25,322,942
1990	23,322,666	10,504,875	33,827,541	0.86974	29,421,193
1991	25,328,557	10,504,875	35,833,432	0.83021	29,749,170
1992	27,124,216	0	27,124,216	0.79247	21,495,140
1993	29,133,802	0	29,133,802	0.75645	22,038,237
1994	30,912,725	0	30,912,725	0.72207	22,320,997
1995	32,916,125	0	32,916,125	0.68924	22,687,237
1996	34,681,499	0	34,681,499	0.65791	22,817,465
1997	34,681,499	0	34,681,499	0.62801	21,780,307
1998	34,681,499	0	34,681,499	0.59946	20,790,293
1999	34,681,499	0	34,681,499	0.57222	19,845,280
2000	34,681,499	0	34,681,499	0.54621	18,943,222
2001	34,681,499	0	34,681,499	0.52138	18,082,166
2002	34,681,499	0	34,681,499	0.49768	17,260,250
2003	34,681,499	0	34,681,499	0.47506	16,475,693
2004	34,681,499	0	34,681,499	0.45346	15,726,798
2005	34,681,499	0	34,681,499	0.43285	15,011,943
2006	34,681,499	0	34,681,499	0.41318	14,329,582
2007	34,681,499	0	34,681,499	0.39440	13,678,238
2008	34,681,499	0	34,681,499	0.37647	13,056,500
2009	34,681,499	0	34,681,499	0.35936	12,463,022
2010	34,681,499	0	34,681,499	0.34302	11,896,521
2011	34,681,499	0	34,681,499	0.32743	11,355,770
2012	34,681,499	0	34,681,499	0.31255	10,839,599
	$798,954,753	$33,508,750	$832,463,503		$471,573,933
			Annualization Factor		0.0713
			Annualized Cost		$33,623,221

Appendix F (Continued)

OPTION 3 - NEW CENTRAL GARAGE (10% INTEREST, 5% INFLATION)

Year	Operating Costs (1987 $)	Capital Costs (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$ 0	$ 0	$ 0	1.00000	$ 0
1988	19,088,600	6,443,400	25,532,000	0.95455	24,371,455
1989	20,932,800	15,034,600	35,967,400	0.91116	32,771,949
1990	22,113,500	0	22,113,500	0.86974	19,233,013
1991	23,511,800	0	23,511,800	0.83021	19,519,664
1992	24,716,800	0	24,716,800	0.79247	19,587,333
1993	26,119,600	0	26,119,600	0.75645	19,758,147
1994	27,315,300	0	27,315,300	0.72207	19,723,422
1995	28,712,600	0	28,712,600	0.68924	19,789,983
1996	29,903,000	0	29,903,000	0.65791	19,673,620
1997	29,903,000	0	29,903,000	0.62801	18,779,365
1998	29,903,000	0	29,903,000	0.59946	17,925,757
1999	29,903,000	0	29,903,000	0.57222	17,110,950
2000	29,903,000	0	29,903,000	0.54621	16,333,180
2001	29,903,000	0	29,903,000	0.52138	15,590,762
2002	29,903,000	0	29,903,000	0.49768	14,882,091
2003	29,903,000	0	29,903,000	0.47506	14,205,633
2004	29,903,000	0	29,903,000	0.45346	13,559,922
2005	29,903,000	0	29,903,000	0.43285	12,943,562
2006	29,903,000	0	29,903,000	0.41318	12,355,218
2007	29,903,000	0	29,903,000	0.39440	11,793,618
2008	29,903,000	0	29,903,000	0.37647	11,257,544
2009	29,903,000	0	29,903,000	0.35936	10,745,837
2010	29,903,000	0	29,903,000	0.34302	10,257,390
2011	29,903,000	0	29,903,000	0.32743	9,791,145
2012	29,903,000	0	29,903,000	0.31255	9,346,093
	$700,862,000	$21,478,000	$722,340,000		$411,306,656
				Annualization Factor	0.0713
				Annualized Cost	$29,326,165

OPTION 4 - RENOVATE EXISTING FACILITY (10% INTEREST, 5% INFLATION)

Year	Operating Costs (1987 $)	Capital Costs (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$ 0	$ 0	$ 0	1.00000	$ 0
1988	19,088,600	11,709,000	30,797,600	0.95455	29,397,709
1989	20,932,800	11,709,000	32,641,800	0.91116	29,741,805
1990	22,113,500	0	22,113,500	0.86974	19,233,013
1991	23,511,800	0	23,511,800	0.83021	19,519,664
1992	24,716,800	0	24,716,800	0.79247	19,587,333
1993	26,119,600	0	26,119,600	0.75645	19,758,147
1994	27,315,300	0	27,315,300	0.72207	19,723,422
1995	28,712,600	0	28,712,600	0.68924	19,789,983
1996	29,903,000	0	29,903,000	0.65791	19,673,620
1997	29,903,000	0	29,903,000	0.62801	18,779,365
1998	29,903,000	0	29,903,000	0.59946	17,925,757
1999	29,903,000	0	29,903,000	0.57222	17,110,950
2000	29,903,000	0	29,903,000	0.54621	16,333,180
2001	29,903,000	0	29,903,000	0.52138	15,590,762
2002	29,903,000	0	29,903,000	0.49768	14,882,091
2003	29,903,000	0	29,903,000	0.47506	14,205,633
2004	29,903,000	0	29,903,000	0.45346	13,559,922
2005	29,903,000	0	29,903,000	0.43285	12,943,562
2006	29,903,000	0	29,903,000	0.41318	12,355,218
2007	29,903,000	0	29,903,000	0.39440	11,793,618
2008	29,903,000	0	29,903,000	0.37647	11,257,544
2009	29,903,000	0	29,903,000	0.35936	10,745,837
2010	29,903,000	0	29,903,000	0.34302	10,257,390
2011	29,903,000	0	29,903,000	0.32743	9,791,145
2012	29,903,000	0	29,903,000	0.31255	9,346,093
	$700,862,000	$23,418,000	$724,280,000		$413,302,767
			Annualization Factor		0.0713
			Annualized Cost		$29,468,487

Appendix G

NET PRESENT VALUE ANALYSIS OF GARAGE CONSTRUCTION OPTIONS

OPTION A - MAINTENANCE FACILITY WITH PERMANENT OUTDOOR STORAGE

(10% INTEREST, 5% INFLATION)

Year	Operating Costs (1987 $)	Capital Costs (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$ 0	$ 0	$ 0	1.00000	$ 0
1988	19,088,600	8,261,000	27,349,600	0.95455	26,106,436
1989	21,555,342	8,261,000	29,816,342	0.91116	27,167,369
1990	22,771,463	0	22,771,463	0.86974	19,805,270
1991	24,211,712	0	24,211,712	0.83021	20,100,736
1992	25,452,662	0	25,452,662	0.79247	20,170,482
1993	26,897,746	0	26,897,746	0.75645	20,346,774
1994	28,129,317	0	28,129,317	0.72207	20,311,195
1995	29,568,536	0	29,568,536	0.68924	20,379,932
1996	30,794,648	0	30,794,648	0.65791	20,260,249
1997	30,794,648	0	30,794,648	0.62801	19,339,328
1998	30,794,648	0	30,794,648	0.59946	18,460,268
1999	30,794,648	0	30,794,648	0.57222	17,621,165
2000	30,794,648	0	30,794,648	0.54621	16,820,203
2001	30,794,648	0	30,794,648	0.52138	16,055,648
2002	30,794,648	0	30,794,648	0.49768	15,325,846
2003	30,794,648	0	30,794,648	0.47506	14,629,216
2004	30,794,648	0	30,794,648	0.45346	13,964,252
2005	30,794,648	0	30,794,648	0.43285	13,329,513
2006	30,794,648	0	30,794,648	0.41318	12,723,626
2007	30,794,648	0	30,794,648	0.39440	12,145,280
2008	30,794,648	0	30,794,648	0.37647	11,593,222
2009	30,794,648	0	30,794,648	0.35936	11,066,257
2010	30,794,648	0	30,794,648	0.34302	10,563,245
2011	30,794,648	0	30,794,648	0.32743	10,083,098
2012	30,794,648	0	30,794,648	0.31255	9,624,775
	$721,184,394	$16,522,000	$737,706,394		$417,993,387
			Annualization Factor		0.0713
			Annualized Cost		$29,802,928

Appendix G (Continued)

OPTION B - PHASED CONSTRUCTION (10% INTEREST, 5% INFLATION)

Year	Operating Costs (1987 $)	Capital Costs (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$ 0	$ 0	$ 0	1.00000	$ 0
1988	19,088,600	8,261,000	27,349,600	0.95455	26,106,436
1989	21,555,342	8,261,000	29,816,342	0.91116	27,167,369
1990	22,771,463	0	22,771,463	0.86974	19,805,270
1991	24,211,712	0	24,211,712	0.83021	20,100,736
1992	25,452,662	0	25,452,662	0.79247	20,170,482
1993	26,897,746	5,800,000	32,697,746	0.75645	24,734,179
1994	27,315,300	0	27,315,300	0.72207	19,723,422
1995	28,712,600	0	28,712,600	0.68924	19,789,983
1996	29,903,000	0	29,903,000	0.65791	19,673,620
1997	29,903,000	0	29,903,000	0.62801	18,779,365
1998	29,903,000	0	29,903,000	0.59946	17,925,757
1999	29,903,000	0	29,903,000	0.57222	17,110,950
2000	29,903,000	0	29,903,000	0.54621	16,333,180
2001	29,903,000	0	29,903,000	0.52138	15,590,762
2002	29,903,000	0	29,903,000	0.49768	14,882,091
2003	29,903,000	0	29,903,000	0.47506	14,205,633
2004	29,903,000	0	29,903,000	0.45346	13,559,922
2005	29,903,000	0	29,903,000	0.43285	12,943,562
2006	29,903,000	0	29,903,000	0.41318	12,355,218
2007	29,903,000	0	29,903,000	0.39440	11,793,618
2008	29,903,000	0	29,903,000	0.37647	11,257,544
2009	29,903,000	0	29,903,000	0.35936	10,745,837
2010	29,903,000	0	29,903,000	0.34302	10,257,390
2011	29,903,000	0	29,903,000	0.32743	9,791,145
2012	29,903,000	0	29,903,000	0.31255	9,346,093
	$704,356,425	$22,322,000	$726,678,425		$414,149,569
			Annualization Factor		0.0713
			Annualized Cost		$29,528,864

Appendix G (Continued)

OPTION C - THREE SMALL GARAGES (10% INTEREST, 5% INFLATION)

Year	Operating Costs (1987 $)	Capital Costs (1987 $)	Total Costs (1987 $)	Discount Factors (10,5)	Discounted Cost
1987	$ 0	$ 0	$ 0	1.00000	$ 0
1988	19,088,600	9,278,333	28,366,933	0.95455	27,077,527
1989	21,407,975	9,278,333	30,686,308	0.91116	27,960,045
1990	23,053,324	9,278,334	32,331,658	0.86974	28,120,162
1991	24,924,859	0	24,924,859	0.83021	20,692,796
1992	26,590,333	0	26,590,333	0.79247	21,072,053
1993	28,465,140	0	28,465,140	0.75645	21,532,428
1994	30,112,387	0	30,112,387	0.72207	21,743,101
1995	31,982,965	0	31,982,965	0.68924	22,044,063
1996	33,619,943	0	33,619,943	0.65791	22,119,051
1997	33,619,943	0	33,619,943	0.62801	21,113,640
1998	33,619,943	0	33,619,943	0.59946	20,153,929
1999	33,619,943	0	33,619,943	0.57222	19,237,841
2000	33,619,943	0	33,619,943	0.54621	18,363,394
2001	33,619,943	0	33,619,943	0.52138	17,528,694
2002	33,619,943	0	33,619,943	0.49768	16,731,935
2003	33,619,943	0	33,619,943	0.47506	15,971,393
2004	33,619,943	0	33,619,943	0.45346	15,245,421
2005	33,619,943	0	33,619,943	0.43285	14,552,447
2006	33,619,943	0	33,619,943	0.41318	13,890,972
2007	33,619,943	0	33,619,943	0.39440	13,259,564
2008	33,619,943	0	33,619,943	0.37647	12,656,857
2009	33,619,943	0	33,619,943	0.35936	12,081,545
2010	33,619,943	0	33,619,943	0.34302	11,532,384
2011	33,619,943	0	33,619,943	0.32743	11,008,185
2012	33,619,943	0	33,619,943	0.31255	10,507,813
	$777,164,612	$27,835,000	$804,999,612		$456,197,238
			Annualization Factor		0.0713
			Annualized Cost		$32,526,863

Appendix H

ANALYSIS OF COMMUNICATION REQUIREMENTS

The following is a summary of the options available for a Commission-owned radio system, should the Commission take over the Wheel-Trans service. All cost estimates are based on 1987 fleet sizes.

1. Use Existing Wheel-Trans Radio Equipment and Channel

In this option, it is assumed that All-Way will no longer have any use for the radio equipment which is currently used for the Wheel-Trans operation. It is assumed that the All-Way vehicles will have reached their life expectancy and will be scrapped. This may not, however, be a valid assumption since All-Way could keep the vehicles for use in other services, and would therefore still require the radio equipment.

It is possible, however, that All-Way could lose the rights to use the channel set aside for the Wheel-Trans operation, if they did not receive the contract to provide Wheel-Trans service in the future. The Federal Department of Communications (DOC) has indicated that the Commission would not automatically be assigned this channel. In this event, the DOC would conduct a loading calculation based on all channels currently assigned to the Commission and would only assign an additional channel for Wheel-Trans if it were justified.

This existing system is "simplex", i.e. one radio frequency is used for both transmission and reception. All vehicles hear transmissions from other vehicles if they are within range. All-Way indicates that the existing area of coverage is satisfactory (after some start-up problems).

All-Way owns the base station radio and antenna and rent the antenna site from Marconi (a radio supplier). It is assumed that it would be necessary to purchase such equipment should the Commission take over the Wheel-Trans operation. This equipment is not compatible with our existing Surface Radio System as it is "simplex" and is not in the same frequency band.

The estimated cost for this option includes purchase of the radios from All-Way, modifications to the radios, purchase of antennae, cabling, etc., installation of the mobile equipment and purchase/installation of base station equipment.

Estimated Capital Cost:	$210,000.00
Estimated Annual Operating Cost:	$ 10,000.00

2. Purchase New Radio Equipment for Use on an Existing TTC Channel

In this option, it is assumed that permission can be obtained to use one of the existing TTC surface radio system channels.

There will be no costs associated with obtaining base station radio equipment or antennae as the existing TTC system is quite satisfactory. There will, however, be costs for the radio control equipment at the Wheel-Trans Dispatch offices.

In this option, it will not be necessary to obtain approval from the DOC for an additional radio channel. (This process has proven to be very difficult and lengthy).

It is unlikely, however, that an existing radio channel could handle the additional capacity required for the Wheel-Trans operation. This option is therefore not likely to be possible.

The estimated cost for this option includes purchase and installation of new mobile radios and associated cabling, antennae, etc., and remote control equipment.

Estimated Capital Cost: $300,000.00
Estimated Annual Operating Cost: $ 10,000.00

3. Purchase New Radio Equipment and Obtain a New Radio Channel

If a new radio channel can be justified to the DOC, it will be located in the 420MHz band. The DOC have indicated that there are no available channels in the 412MHz area, where our current Surface Radio System is located. This new band (420MHz) is not compatible with the 412MHz band, thereby requiring purchase of a new base antenna and associated multicoupling equipment.

The estimated cost for this option includes purchase and installation of new mobile radios, associated equipment and a new base station network similar to that used for the Surface Radio System.

Estimated Capital Cost: $360,000.00
Estimated Annual Operating Cost: $ 15,000.00

4. Cellular Telephones

It is possible to acquire cellular telephones for installation on the Wheel-Trans vehicles. Since these units communicate via an existing cellular base radio system (owned by others), there will be no requirement for the Commission to acquire and install base radio equipment. However, the cost of cellular telephones is much higher than conventional radios. This option is therefore not desirable in terms of capital and operating costs.

Estimated Capital Cost: $400,000.00
Estimated Annual Operating Cost: $ 60,000.00